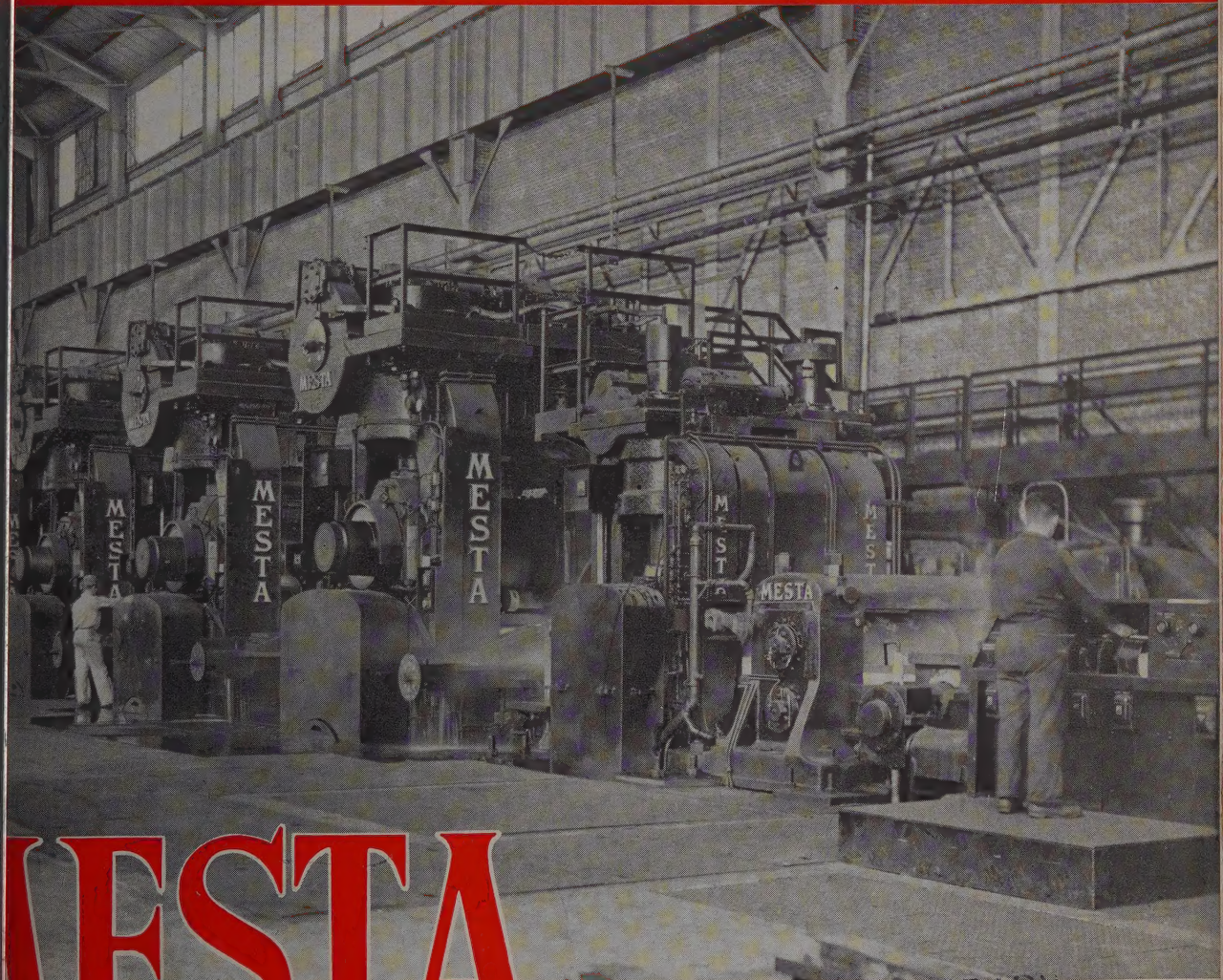


June 26, 1939

# STEEL

DUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882



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Built in two sizes, the Heald No. 174 Machine will swing work 36" O. D. with adjustment from 6" to 14"; the Heald No. 175 Machine swings work 42" O. D. with adjustment of 11 3/4" to 20 1/4". Either or both of these machines can be had gladly on request.

The close-up view of the No. 174 grinding machine shows the diesel rods. Such work can be done but work can be done 48 1/4" from the

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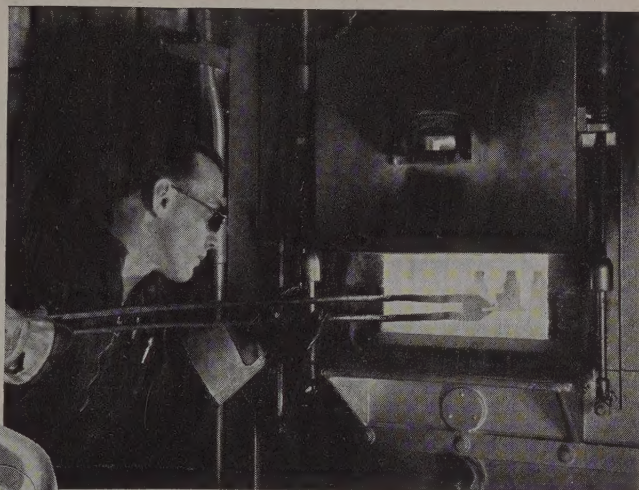
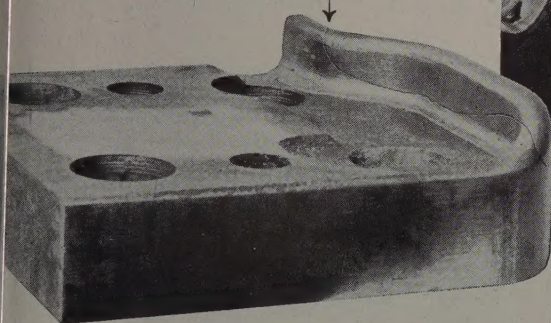
USE A *Heald* FOR PRECISION • PRODUCTION • PRECISION



# Steel may crack after Quenching

On the  
tempering has been  
delayed too long

This is an example of parts which have been spoiled by delayed tempering. Steel was perfectly sound.



Even with medium-carbon steel it is safest to place the part in the tempering furnace as it is withdrawn from the quenching bath.

A cracked die, illustrated above, is an example of frequently made in heat-treating high-strength quenching was carried out correctly, but tempering was delayed too long. A brief consideration of quench and temper treatment will show why this is true.

**Effect of quenching** a part is, of course, to harden the steel. This great increase in hardness is a change, a refinement, in the structure of the steel that comes about from rapid cooling. However, as a side result of drastic cooling, another change, physical in its nature, also takes place. Tensile stresses are "locked up" in the steel—the same stresses that shatter glass if it is suddenly cooled from high temperature.

**Effect of tempering** or drawing, then, is two-fold. It enables the treater to develop the desired combination of strength, ductility and impact resistance by tempering the brittle "as-quenched" steel. Equally important, tempering relieves the high stresses which are locked up in quenching—stresses so high that they will often cause a part to rupture if it is left for any length of time in the as-quenched condition.

**Immediate tempering** is the only way of overcoming quenching stresses and eliminating the danger of actual or incipient ruptures. By "immediate" is meant before the part has cooled to room temperatures. The steel must be left in the quenching medium long enough for full hardness to develop, of course, but in most grades the refinement of structure has been completed by the time the part has cooled to 200 deg. F. Bethlehem suggests, therefore, that parts be placed in the tempering furnace before they reach room temperature and while they are still between 100 and 200 deg. F.

**Danger of rupture** and consequent loss of the part is greatest in steels containing a high percentage of hardening elements—carbon, manganese and alloys. However, even medium-carbon steels may be damaged by quenching strains if not tempered immediately. This is especially true of parts with intricate shapes, thin sections, etc.

If you are having trouble with quenched-and-tempered parts, Bethlehem metallurgists can probably be of help. Don't hesitate to call on these men. A request entails no obligation whatsoever on your part.

*Because numerous requests for copies of advertisements of this series have been received, reprints of this page have been made available. Simply write Bethlehem Steel Company, Bethlehem, Pa., and state the number desired.*

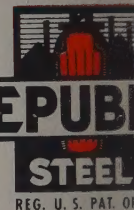
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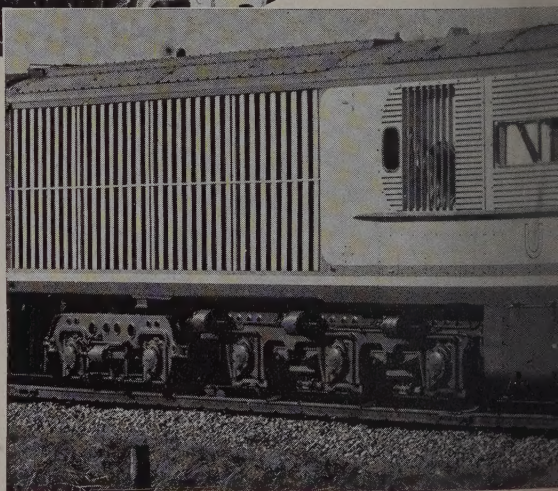
# Light Weight

## HIGH STRENGTH MATERIAL



Note the formed sections of Republic Double Strength Steel in this construction photograph. Here the locomotive is ready for the installation of equipment.

One of two identical units comprising the new locomotive, capable of either multiple or independent operation. Built in part of Republic Double Strength Steel—this 5000 horsepower steam turbine-electric locomotive is designed to haul a 12-car train. Running between Chicago and the Pacific coast over 2.2 percent grades without a helper, it will operate at altitudes exceeding 8000 feet above sea level and encounter climatic variations in temperature between 40 degrees below zero and 115 degrees above.



# REPUBLIC

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# a vital consideration in the design of this radical departure from the conventional form of steam motive power

ly two years have been spent by  
neers in designing and building this  
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necessity for saving weight, they fol-  
ed the modern trend — using new  
struction methods and specifying  
a tensile steels.

epublic Double Strength Steels were  
l in the entire frame in the shape of  
ned sections, for all braces and also

in the sides and roof of this locomotive.

In addition to high strength with less  
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higher resistance to corrosion, due to its  
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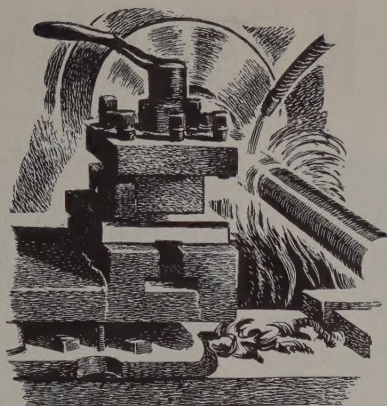
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"Even non-ferrous metals are entirely free from corrosion now. Tarnishing of machined parts is banished 100%. This oil will not oxidize on the metal bed or surface of slide-ways or spindle ways. In fact, it's a fine surface lubricant.

"Where it was formerly necessary to use several different oils to avoid difficulties, we now use TYCOL #655 Cutting Oil in all machines, on all metals and on all classes of work. We have solved all our machining problems with TYCOL #655 Cutting Oil."

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**TIDE WATER DIVISION, 17 BATTERY PLACE**

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**CUTTING OILS**  
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# READER



# Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

## Will Broaden Use

Editor:

Mr. Hartford's article with (STEEL, June 12, p. 23.) is a few comments that I like to make. I am very glad that the direct reduction of iron by any method other than the blast furnace is going to be commercially feasible. Ore conditioning and sintering will entrench the modern blast furnace still further as the method of production. Neither am I in sympathy with smaller units for products at slower speeds. The steel industry is a tonnage industry and we should keep it so.

In the coal mines can I foresee a major change in the industry which could be compared in scale with the changes brought about by the installation of continuous mills. I believe that the changes we will see, through mechanization, as great a change in mining methods as the changes have seen in the production of sheets.

A tremendous factor of labor saving to accentuate the elimination of labor, and labor-saving devices of all kinds will undoubtedly be a prominent part of capital expenditures for the next few years. Unfortunately but on the other hand, it is a cheap, tonnage product for the public and the government to want a low-price product. The steel industry can bring about lower prices the volume of production should increase and any surplus placed in the steel mills

should be made up many times over by the additional uses of steel, due to its price advantage over many other commodities.

Standardization of products should further simplify the production of large tonnages and this is an item that must and will be given major consideration in the near future, I am sure.

Vice president,  
Republic Steel Corp.,  
Cleveland

C. M. WHITE

## Too Many Furnaces Obsolete

To the Editor:

Referring to R. L. Hartford's article, our particular slant on this picture would be built around our experience and acquaintance with the furnaces used in the manufacture of steel.

The majority of furnaces used today were designed and built with the quality of steel used ten years ago in mind.

Today there exists an entirely different situation, in that the consumer demands a quality of steel that was not considered commercial ten years ago. The use of obsolete and semi-obsolete furnaces always means a compromise with quality as well as increased cost of production.

Steel is being put to wider uses every day, and largely because of improved quality.

Modernization of existing obsolete and semi-obsolete furnaces will go a long way toward reaching the high

standards of steel quality demanded today, and at the same time provide a proper tool for the metallurgist to accomplish the required purpose.

P. M. OFFILL

Vice President,  
Amsler-Morton Co.,  
Pittsburgh

## New Research Aim Needed

To the Editor:

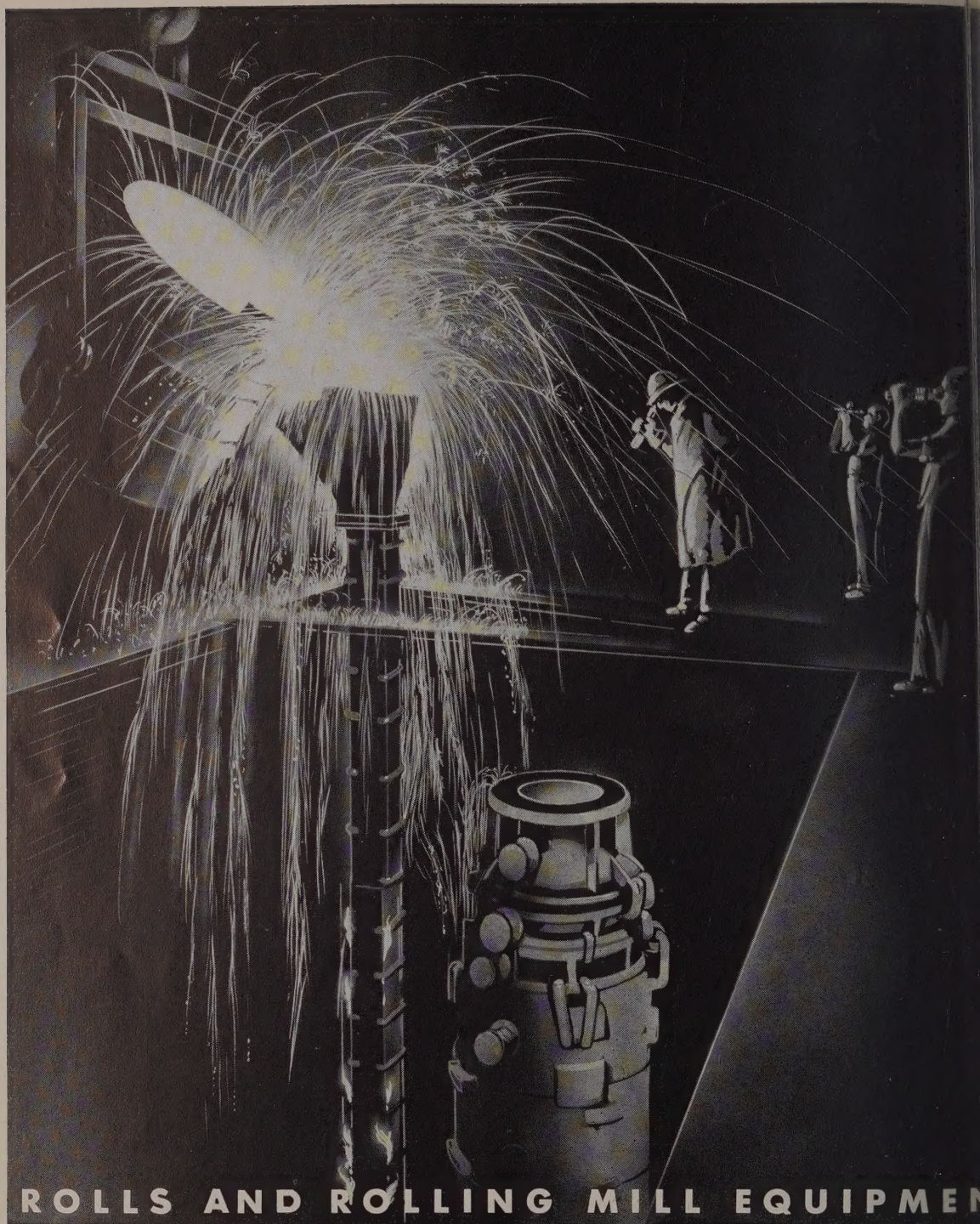
With all due respect for the billions of dollars of invested capital the steel industry represents, I still feel that the industry as a whole has handled its research and development rather poorly. Not as well, for instance, as the automotive industry, the chemical industry, the electrical industry, to name a few.

Steel industry research and development consists mainly of trying to keep up with customers' demands for something the industry cannot make profitably. The industries who do well and earn profits commensurate with the capital invested in them spend their research energy and their development dollars finding what they can make and sell profitably. The difference is just enough to account for the difference in profits realized.

It is not too late by any means for the steel industry to orient its policy from one which invariably leads to no profits to one which has proven to be conspicuously successful in earning profits.

ROBERT E. KINKEAD  
Consulting Engineer,  
Cleveland





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# STEEL

ESTABLISHED 1882

## Contents

Volume 104—No. 26

June 26, 1939

READER COMMENTS .....	9
AS THE EDITOR VIEWS THE NEWS .....	13
NEWS	
Steel Producers Out Millions on Recent Sales Drive .....	15
Industry's Lack of Accurate Cost Figures Causing Heavy Loss .....	16
"Sorry Financial Picture" Due to Poor Merchandising, Says E. T. Weir ..	17
More Uniformity in Heated Metal Products Aim of Furnace Builders ..	18
Steelworks Operations for Week .....	19
Men of Industry .....	20
Obituaries .....	21
Activities of Steel Users and Makers .....	22
Financial News of Steel Industry .....	22
Machine Tool Show Oct. 4-13 .....	23
"Industry Ready for War Demand" .....	23
Tells Story of Roller Bearings .....	27
Aviation .....	27
Anniversaries .....	32
WINDOWS OF WASHINGTON .....	25
MIRRORS OF MOTORDOM .....	29
EDITORIAL—Why Worry About the Machine? .....	34
THE BUSINESS TREND	
Sentiment Improves on Post-Holiday Rise .....	35
Charts and Statistics .....	36-37
FORUM ON RE-EMPLOYMENT .....	38
TECHNICAL	
New Materials for Electric Equipment .....	40
Quality in Steel .....	56
Convention Celebrates Hundredth Anniversary of Electroplating .....	57
JOINING AND WELDING	
Light-Weight Box Cars, Part I .....	44
MATERIALS HANDLING	
Plating Conveyor .....	46
HEAT TREATING	
Saving the Surface .....	49
PROGRESS IN STEELMAKING	
Work-Temperature Control .....	52
INDUSTRIAL EQUIPMENT .....	64
NEW METAL PRODUCTS .....	68
MARKET REPORTS AND PRICES .....	69
The Market Week .....	70
BEHIND THE SCENES .....	80
CONSTRUCTION AND ENTERPRISE .....	86
INDEX TO ADVERTISERS .....	92



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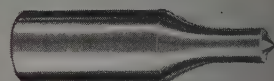
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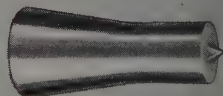
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Yes Sir, we do have a wide experience in the manufacture of these Small Tools—in fact, we have been making them for over fifty years and are sure that a trial order will convince you of the economy of using Cleveland Quality Products.

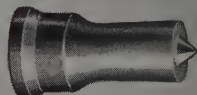
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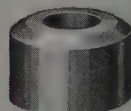
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# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

## the Editor views the News

G the recent "orgy of competition" the steel donation to its customers, in the form of is, is estimated (p. 15) as somewhere between \$3,000,000 and \$50,000,000. Full finished steel, for example, sold at prices that average \$12.50 per ton of production. While prices on steel products are tending toward greater firmness (p. 69) largely has been done and the year's financial picture of the steel industry indicated. For the business recently placed at unprofitable levels includes requirements over the rest of this year. T. Weir, chairman, National Steel Corp., in this condition (p. 17) on the industry's chief executives. E. J. Kulas, president, Otis Steel Co., (p. 16) for a better understanding of steel prospects.

Production last week (p. 19) advanced 2 points per cent of ingot capacity, the highest level since March. Total volume of steel consumption (p. 69) shows no significant fluctuation up or down. Decline of automobile production soon will become marked as the industry (p. 29) swings into the model change-over season. . . . The fourth national Machine Tool Exposition, the first since 1935, is to be held (p. 23) in New York, Oct. 4-13. The announcement is significant; such expositions in the past have stimulated improvements in the demand for capital goods. . . . A program to improve uniformity of machine tool parts has been launched (p. 18) by the Industrial Furnace Manufacturers Association. . . . Available (p. 33) is the American Iron and Steel Institute's statistical report for 1938.

The rabbit out of the White House hat is the President's \$3,060,000,000 spend-pled program (p. 1). Far, in view of the results of previous government spending, it has created very little stir. The new revenue bill, more friendly to business, is expected to be signed by the President before June 1. Special senate committee last week (p. 26) reported that profit might be encouraged in industry through

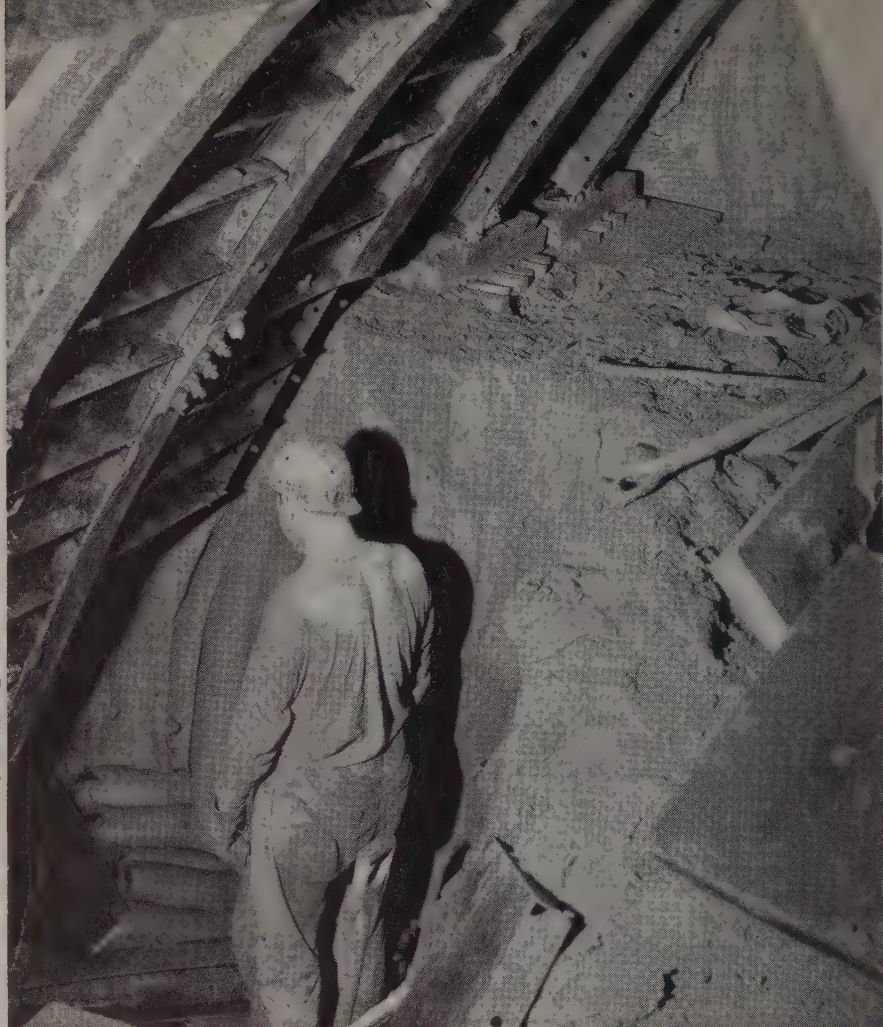
prudent experiments in incentive taxation; the subcommittee believes such systems make capitalists of workers, completely changing their attitude toward the industrial system, "an imperative national need". . . . The bureau of standards, on pure iron research, (p. 30) has produced several 1-pound ingots containing only 0.01 per cent impurities.

This week's contributor to STEEL's Forum on Re-Employment (p. 38) is Ernest T. Trigg, president, National Paint, Varnish and Lacquer Association Inc. He is optimistic over prospects for increased activity in the construction field. . . . Glass fabric, cellophane and other cellulose insulating materials are displacing (p. 40) much cotton, linen and mica in the construction of electric motors; a new, low-loss, silicon steel is gaining as material for laminations; a whole new series of insulating varnishes is available; rotor windings are being cast of magnesium alloys; many brushholders now are die cast. . . . Welded light-weight underframes of new box cars weigh 2082 pounds less (p. 44), reducing nonincome producing loads hauled by the railroads.

Noise associated with arcs that terminate spot welds is eliminated (p. 42) by a new device. . . . Reduced costs and other advantages are obtained (p. 46) with a new type conveyor for automatic plating, pickling, burnishing, bonding and related operations. . . . A new process permits heat treatment of all types of work in the same protective atmosphere (p. 49); the product is scale-free, resulting in reduced cleaning and polishing time. . . . Slab heating furnace at Bridgeport Brass Co.'s new rolling mill has a new type automatic control (p. 52) which permits more uniform results and aids rolling. . . . Electroplating's 100th anniversary was celebrated last week (p. 57) at the annual convention of the American Electro-Platers' society.

*EC Kreutzberg*





Section  
Hi-Steel  
Contra  
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Chicago

# Chicago's New Subway Takes Shape with Special Steel Sections Made by INLAND

• Tunneling for Chicago's new subway goes forward rapidly—and here again Inland engineers have co-operated from the early planning stages.

After a thorough study of the problem, special I-Beam arch ribs and liner plates were designed for the job by Inland engineers—permitting quicker setup and a less costly method of sustaining earth pressures prior to the placing of concrete. Plates were designed and tested for pressures of 4,000 lbs. per square foot.

Liner plates and ribs transmit pressure into trusses, held apart by timber cross braces, placed

high enough to allow ample working space. Trusses are made of Inland Hi-Steel (high strength low-alloy), to keep weight to a minimum so that they may be erected and dismantled by hand during tunneling operations.

Inland engineers, working closely with the contractors, have helped them develop a practical, economical method of handling this particular job. This practical co-operation is typical of Inland and is a good indication of the engineering service you can expect from Inland on all types of construction work involving the use of steel.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCEMENT



# Steel Producers *Out Millions* On Recent Sales Drive

Now that the recent "orgy of competition"—as it is referred to in the steel industry—has subsided, producers are figuring up their loss. Estimates of price concessions run all the way from "a very conservative" \$13,200,000 on 1,900,000 tons of hot and cold rolled sheets and strip, to \$50,000,000 on 5,000,000 tons of flat rolled mate-

rial figures on the volume of which, of course, are lacking, but competitive sources in the industry say it is heavy, and that it will seriously affect earnings statements for the year.

One source, selling largely to the automotive industry, estimates that less than 900,000 tons of cold rolled sheets and 1,000,000 tons of hot rolled were sold during the relatively short period of the sales drive. Cold rolled sheets generally were sold at \$8 a ton, and hot rolled \$6 a ton, with greater concessions on a considerable portion of the tonnage.

The larger estimate includes galvanized sheets which were sold at a concession of \$10 a ton, and in some instances as much as \$12 a ton. Plates, bars and shapes also were affected to some extent.

One of the most regrettable features, it is pointed out, is that shipments in many instances will extend through the remainder of the year, much longer than was contemplated

when mills met the first onslaught of competition. One large automobile company is understood to have covered its requirements until next February. The majority of consumers of flat rolled products are said to have booked heavily for the remainder of the year.

## Producers Blaming Themselves

No concession in recent years has caused so much self-criticism within the industry as this. Producers, blaming themselves, say they were out-generalled by buyers in the automotive industry. The incident is referred to as "a perfect example" of how over-anxious the mills are to stimulate business and book orders, unmindful of cost.

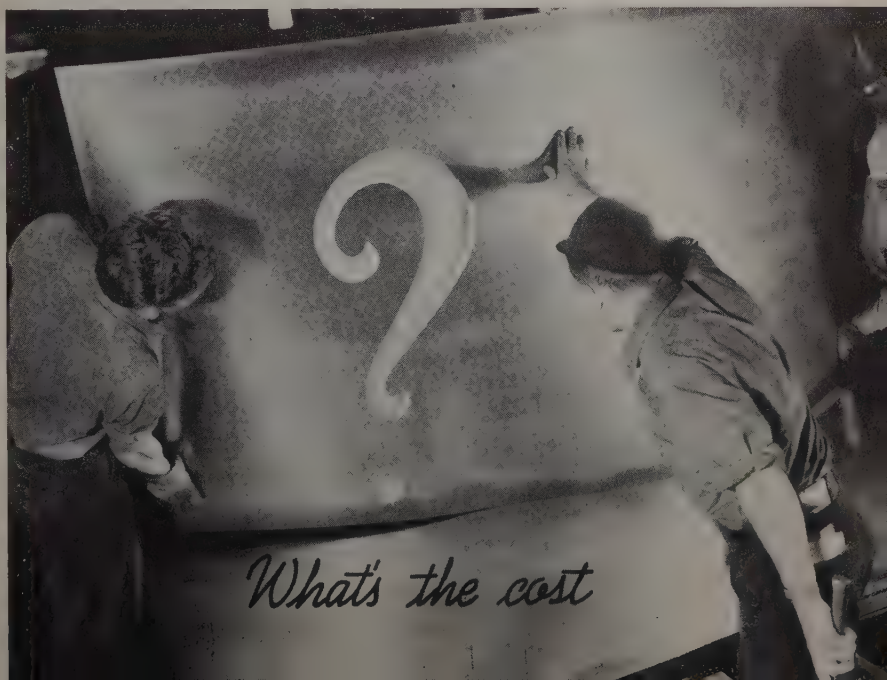
The steel industry's financial loss in 1938 was \$15,000,000. The sharp break in sheet and strip prices last fall contributed heavily to this. Yet, while still smarting from it, the in-

dustry at one sweep cuts from actual sales prices an amount at least as large.

A full realization of the extremes to which competition went now leads some producers to suggest a cost-finding committee for the industry; some wish for a return of NRA days, with a code of fair practice. They point out that labor costs are "pegged," taxes constitute a first and very definite charge, government is exercising unparalleled control of the industry; and about the only reasonable and safe maneuver remaining is to determine costs, then stand firmly for a fair profit.

A typical plant, equipped with the most modern continuous strip mills and appurtenances, obtaining its raw materials as cheaply as they may be had in its area, gives this breakdown of its present cost for producing a ton of cold rolled, full-finished sheets, operating at 50 per

## An Item That Needs More Careful Inspection?



*What's the cost*

◆  
Some steel producers say they had sacrificed most of their overhead cost in meeting recent sharp competition, but a substantial portion of consumers' requirements for flat rolled products for the remainder of the year is booked. "Rule-of-thumb" methods for determining this item of cost are to prevail in many cases; a cost-finding committee for the industry has been suggested



cent of its capacity:	
Manufacturing cost, all items	
except dividends .....	\$46.00
Shipping expense .....	1.50
	<hr/>
	\$47.50
General overhead, including	
administration, selling, tax-	
es, depreciation, bond inter-	
est, etc. ....	15.00
Total .....	\$62.50

This is believed to represent a fair average for well-equipped mills.

The nominal base price for the sheets as quoted today is back up to \$61 a ton. Yet the producer says that in order to hold his trade it was necessary for him to book full-finished sheets at \$50, base, or \$12.50 a ton below cost.

He is within easy shipping distance of the Detroit automobile area. Producers farther away had to absorb \$5 or more per ton freight in order to attain a comparable delivery basis.

The extra charged for stretcher leveling is \$5 a ton. For resquaring it is 5 per cent of the sales price, which theoretically would net at best \$2.50. But, it is pointed out,

the scrap loss and labor involved eat up most of this. For stretcher leveling the mill might actually make 50 cents a ton. For "rejects" by exacting consumers, such as automotive users, the mill very often has to absorb as much as 4 per cent of the sales price.

Only 10 to 15 per cent of the product of strip mills is shipped in coils, the comparable base price for cold rolled strip now being \$56 a ton, or \$5 less than the product made into sheets.

"As STEEL pointed out (June 12, p. 23) the industry has spent a billion dollars for modernizing in the last five years, a large share of which was for continuous strip mills," said one producer. "Here we are selling the product of those mills at considerably less than cost."

"The trouble is that we have too much capacity and instead of each waiting and taking his share of available business, some step out, and away goes the market."

"It has been said that they have some chance for making up their loss on other products. Even so, the competition engendered, the general loss, the reactions among buyers and the public is doing the industry incalculable harm."

materials and labor, we must add the expense, executive and financial overhead, taxes, intangibles, requirements on bonds and preferred stock, depreciation and depletion.

To arrive at the cost in any case, necessary to set some arbitrary but reasonable anti-inflationary production. Add up figures represented by the foregoing items, divide them by that product, and you have the overhead per ton. There is no secret about overhead; just take the annual statement of any company, combine the figures stated above and you will find it if the company is well off. That at approximately 50 per cent production the overhead cost amount to \$15 per ton, on average. By adding such cost to raw materials and labor, we begin to get a rough idea of the total cost of our product. If it is ready to be shipped to the customer.

#### Must Analyze Overhead

Obviously, however, this rule cannot be carried out in too ready a way. You can't charge the same percentage of overhead to a ton of pig iron that you charge to a ton of semifinished steel, the same percentage of overhead to a ton of semifinished steel that you charge to a ton of full finished sheets. Each of these requires different equipment, and consequently more overhead.

It may sound presumptuous that some of us do not know these costs are, yet my knowledge is that not only of the steel industry but of other lines of manufacture do I believe that too often a "thumb" is used to compute.

As a result of this lack of accurate knowledge a chief executive has less hesitation in cutting regular price to secure what appears to be an attractive price. He can, if he wishes, justify price reduction by telling his shareholders that overhead goes on and whether the plant is operating or not, and that he might just as well get what he can while the grass is good.

In the long run, however, this policy has proven ruinous not to many of the individual companies but to the industry as a whole. In one instance, during the past nine years ten steel companies have spent somewhat over half a billion dollars worth of new money. In that same period their depreciation and depletion has amounted to \$902,000,000.

It has cost them in losses, the privilege of doing business in these nine years, over \$88,000,000.

At the same time they have spent \$1,157,000,000 for new construction of one sort or another for the purpose largely of improving

## Industry's Lack of Accurate Cost Figures Causing Heavy Loss

By E. J. KULAS

President, Otis Steel Co., Cleveland

■ DURING the past year or so the steel industry as a whole has been harassed by reckless and unnecessary price cutting which has reduced any potential profits that might have been in sight to a virtual zero.

This price cutting has in no way increased the total market for steel, nor has it opened any new outlets for our product or brought any new customers into the market. It has resulted in some cases in a redistribution of steel orders which, however, in the long run will, I believe, be of little benefit to any individual company.

The forces of competition, the demand for service and quality, automatically allocate the customer's orders to those plants which best meet his requirements and best suit his needs. As a result, even those companies which gain tonnage because of price reduction will probably find it difficult, in some cases at least, to hold the additional tonnage which they have gained over any protracted period.

In my estimation, one of the rea-

sons for price cutting, over and above the desire to get additional business and keep mills operating at full capacity, is a lack of knowledge on the part of many steel companies of their actual "out-of-pocket" expenses and costs for making a ton of steel.

Too many of us regard the manufacturing cost in making our product as the final cost. We think of the cost of our raw material plus our labor as representing the expense to which we have been put in producing a ton of pig iron or a ton of steel.

It needs no second thought to realize that raw materials and labor are only the beginning of the story. Without the plants, without selling effort, without executive supervision, the pig iron or steel would remain in the stock yard until it rusted away.

To really know, therefore, what our costs actually are it is essential that we take a number of elements into consideration.

Starting, of course, with raw ma-



ing costs, and giving better to the customer. With this investment it seems to be sighted not to take advantage of the improved facilities and at least a small return investment.

is another very serious side entire question. If I am right, of accurate cost figures is role in a measure, at least, constant losses which the has faced. I, naturally, recognition to the decreased as which have been during the past decade in making statement.

our selling prices are more in line with our real and costs we will be unable to fair return which we must we are to continue to attract capital to the industry maintain the high wage standard which is now current.

can't shut our eyes to the at even the most modern mill, the most efficient blast or open hearth will be out one of these days, and will be replaced. Unless there

is a promise of at least a reasonable return, where will the money be found to make these replacements? In a nutshell, the future of the steel industry depends to a very substantial extent upon our ability during the next year or two to justify steel stocks as an investment.

#### Profit on Sales Vital

Many unthinking persons have said that these replacements and modernizations can come out of earnings, but, if there are no earnings to attract investors, neither are there earnings to invest in new plants or equipment.

It seems to me, therefore, that it is vital not only to our industry but to the nation at large which depends so greatly upon the steel industry, that we sell our product for what it costs us, plus a reasonable profit. Obviously, this figure will vary according to the efficiency of the individual property, but unless this step is taken there can be no doubt but that there are dark days ahead for the entire steel industry.

## "Sour Financial Picture" Due to Poor Merchandising, Says E. T. Weir

Editor:

I have read the article "Steel Billion for Modernizing" as it is in your June 12 issue.

Survey of the industry for the nine years, including 1938, about the remarkable lack of progress; in fact, I had some figures made up a few days ago covering the results of the nine leading companies in the industry.

For the nine years, the industry went into the money market and borrowed \$512,000,000 and spent during this period in new construction \$1,000,000,000; then, after taking care of interest charges, including preferred dividends (which we consider a

fixed charge in view of the fact that the obligations are cumulative) there was an actual loss of a little less than \$90,000,000 for the common stockholders.

I might say that in these nine companies the common stockholders have something over \$2,000,000,000 invested. The question that comes up is, "Why this sorry picture in financial returns?"

Frankly, I must say that the responsibility is entirely on the chief executives, who have paid little or no attention, as a rule, to the matter of properly merchandising their products and who certainly have not been profit-minded. In an operating

way, no industry is better conducted than ours.

Great improvement has been made in methods, quality of products, service to the public, and in the matter of reducing costs as far as that is possible under the rather discouraging operating conditions we have had during the nine-year period.

There is nothing basically wrong with the industry that justifies the financial situation outlined above except, as I say, failure on the part of the executives operating the companies to be profit-minded and to devote proper time to the matter of merchandising.

I have wondered how long the stockholders with an interest in these companies of over \$2,000,000,000 would carry on without demanding an accounting from the executive management they have put in control of their investment. It goes without saying that at the rate we are going—and it is now being discussed in financial circles—the steel industry will not be able to finance new improvements and technological improvement will necessarily decline.

It is a serious situation and one that gives me great concern. From time to time we hear that large buying groups break the market on steel. This is absolutely unjustified because steel buyers are, as a group, perfectly willing to pay fair, living prices to the industry. It is all in the hands of the executive management.

E. T. WEIR

Chairman,  
National Steel Corp.,  
Pittsburgh

## An Engineer's Viewpoint On Profitless Selling

To the Editor:

Referring to improvements in the steel industry, no amount of development work can overcome unsound selling policies . . . Until there is a disposition in high places (meaning both government and industry) to insist upon corporations selling their product for at least something above its cost, it is not likely that there will be any evenly progressive trend of any kind.

R. J. WEAN

President,  
Wean Engineering Co.,  
Warren, O.

## Steel Capacity Up; Production and Profits Down

Capacity (Tons, steel ingots)	Production	Employees	Total payrolls	†Profits
63,784,389	56,433,473	†458,347	†\$841,253,000	\$414,241,340
65,165,541	40,699,483	†.....	†.....	185,926,577
68,980,181	25,945,501	†303,000	†417,000,000	*17,611,045
70,340,101	13,681,162	†.....	†.....	*157,118,391
70,191,431	23,232,347	313,421	317,873,000	*70,337,719
71,353,776	26,055,289	409,949	457,842,517	*14,703,536
70,046,366	34,092,594	425,941	557,793,714	62,961,961
69,789,554	47,767,856	499,704	758,059,542	156,526,000
69,775,334	50,568,701	572,244	976,032,169	228,276,000
71,594,320	28,349,991	443,000	613,199,000	*14,879,000

Capacity, as of Dec. 31, preceding years. †Bureau of Census figures; no reports for 1930, 1932; other figures by American Iron and Steel Institute. †Years 1929-1933, inclusive, STEEL'S annual official earnings compilation, adjusted; 1934-1938, inclusive, American Iron and Steel Institute reports. \*Deficit.

■ Vaudeville and circus ballyhoo figured in methods for selling safety to steelworkers during early days of the industry's accident prevention campaign. One large steel company in 1912 and 1913 sponsored a traveling safety show which played in various towns to audiences of 750 to 2500 steel employees and their families.



# More Uniformity in Heated Metal Products Aim of Furnace Builders

■ A PROGRAM designed to improve the uniformity of metal products subjected to heating operations has been launched by the Industrial Furnace Manufacturers Association Inc. Organization plans of the joint committee directing the program were discussed in detail at the association's ninth annual meeting at Briarcliff Lodge, Briarcliff Manor, N. Y., June 19-20. Immediately following this, the various interests represented on the joint committee conducted their first meeting, June 21, at Hotel Roosevelt, New York.

The uniform metal products program is in no way designed to affect the metallurgical specifications of ferrous or nonferrous metals, but will be directed primarily to shops heat treating fabricated or semifabricated products, in which, it was pointed out, there is continual variation in physical properties frequently attributed to the material, but which is more often due to improper methods of heating and cooling.

Broad aspects of this program to improve shop practice as will result in greater uniformity of metal products so essential to industrial progress and plans of the ordinance department for national defense were presented to the joint meeting by J. A. Doyle, W. S. Rockwell Co., New York, and retiring president of the Furnace Manufacturers association.

The program probably will be carried out principally through an educational campaign by chapters of metallurgical societies since it then would reach production men directly concerned with heat treating problems. It is expected the program will be extremely beneficial in that it will reduce the number of complaints received by steel and metal companies. The program will not designate any particular treatment method, but is expected to result in more intelligent selection of furnace equipment and improved operations.

## Five Organizations Co-operate

Stewart N. Clarkson, executive vice president of the Furnace association, was selected secretary of the joint committee composed of representatives of the Industrial Furnace Manufacturers association, American Iron and Steel institute, American Society for Metals, Copper and Brass Research association, and Aluminum association.

Extensive discussion of the program took place at the meeting of Furnace Manufacturers at Briarcliff Manor.

A number of illustrations were

cited to indicate that more uniform products can be produced by instituting effective control beginning at the charging end of the furnace. For instance, a tractor manufacturer issued specifications for tread castings which clearly defined the composition and heat treatment of the metal. Several makers of castings using identical mixtures with identical pyrometer chart readings delivered products of varying degrees of uniformity, however. As a result, the tractor interest has amended its specifications with the requirements that the pieces shall be heated and cooled individually.

## Furnace Practice Improved

Condenser tubes were mentioned as another example. Different methods of loading furnaces resulted in different degrees of annealing. A study of the problem by the producer and consumer led to the agreement on the method of heating and cooling the tubes individually so that each was exposed to the same temperature for the same time, at the same rate and in the same manner. Improvement in uni-

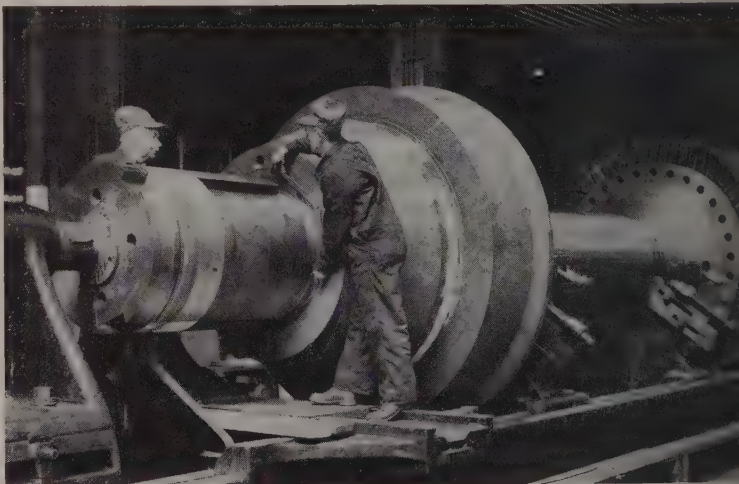
formity gained through this practice was striking.

It also was pointed out that bolt and nut manufacturers making the same products to the same specifications and from the same materials purchased from the same producers. Furnaces were identical. One company made 500 pounds per hour second 2000. Temperatures were uniform, but the results varied greatly. The problem was solved by suggesting changes in methods of loading the furnaces.

The increasingly complex state tax structure also was discussed at the Furnace Manufacturers meeting. The state system declared equivalent to the barriers in Europe and an equally difficult problem for large companies doing business in most states. Also, a company doing business in a foreign state and failing to register, may be liable to many penalties and severe penalties. Some even refuse to permit a corporation to enter a defense to argue where it has not been registered qualified to do business in the state.

As an illustration of excessive state taxes it was noted that the payroll of one corporation in New York state, including state corporation, figured \$2.45 per day per man. It was suggested that the state should start a nation-wide effort to block increasing state taxes.

## Allis-Chalmers Production Again in Full Swing



■ Allis-Chalmers Mfg. Co.'s operations at West Allis (Milwaukee) have been resumed in full, following a short holiday and strike early in June. Negotiations over a labor agreement were temporarily deadlocked until the union ratified the new contract, essentially the same as the one in force the past year.

Photo shows a huge shaft for one of three 30,000 kilovolt-ampere, 13,

800-volt, 75 revolutions-per-minute water wheel generators. They are being constructed for TVA's Conneaut Falls dam. The shaft proper is 10 feet in diameter, more than 100 feet long. The thrust block, mounted on it, is being machined. Approximate weight of the shaft, as machined, is 105,000 pounds—an example of machining operations in progress at West Allis.



Individual groups can take but it is difficult to make action effective, it was said.

Furnace Manufacturers also the possibility of making effective use of arbitration which now are operative in 4 states. Through arbitration is possible to settle many out of court. If such arbitrations, the cases may be carried to the state supreme courts, without the necessity of resorting to lower courts. Arbitration is applied in a great many cases, testing of the validity of being an exception. Retiring president Doyle also made the statement that it might be possible to apply the same principle of arbitration to relations with em-

furnace industry has drawn complete rules governing its practices but it was agreed such rules cannot be made under present laws. It pointed out, however, that there is a tendency to give the fed- eral commission more power that perhaps trade practice may be applied beneficially at time in the future.

#### Holcroft Elected President

At the final meeting, June 20, Holcroft, Holcroft & Co., Delaware was elected president to succeed Mr. Doyle. Membership of the board of directors was increased by the retiring president hence automatically becoming a member. R. E. Talley, George J. Co., Pittsburgh, was elected a member of the board representing the combustion division, succeeding R. F. Benzinger, Electric Co., Salem, O. Other members of the board are: J. W. Barker, Furnace Co., Pittsburgh, steel division; G. W. Tall Jr., Leeds & Co., Philadelphia, resistance furnace division; R. W. Porwindell-Dressler Corp., Pittsburgh, ceramic division; A. B. Ross Engineering Co., New York, oven division; and J. Earl Frazier-Simplex Inc., Pittsburgh, glass division. Stewart N. son, 420 Lexington avenue, New York, was re-elected executive president.

Others attending the meeting include: C. L. Ipsen and R. D. Vanstrand, General Electric Co., Pectady, N. Y.; J. H. Germany, W. Woodward, Westinghouse & Mfg. Co., East Pittsburgh, P. C. Osterman, American Gas Co., Elizabeth, N. J.; F. Crooke, Swindell-Dressler Corp., Pittsburgh; W. M. Hepburn, Sur-combustion Corp., Toledo, O.; Hayden, Lindberg Engineering Co., Chicago; and W. D. Little, Ins Mfg. Co., Detroit.

## District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended June 24	Change	Same week 1938	1937
Pittsburgh ...	47	+ 7	24	82
Chicago ...	49.5	None	24.5	63.5
Eastern Pa. ...	38	+ 1	27	67
Youngstown ...	54	+ 2	32	29
Wheeling ...	79	+ 6	38	93
Cleveland ...	55.5	None	23	49
Buffalo ...	39.5	- 4.5	28	88
Birmingham ...	71	None	42	83
New England ...	32	- 8	15	92
Cincinnati ...	60	-13	14	86
St. Louis ...	42	None	36.6	93
Detroit ...	57	None	29	99
Average ...	54.5	+ 2	28	74

## Republic Adds Butt-weld Mill at Youngstown

Contracts have been let by Republic Steel Corp., Cleveland, for addition to its Youngstown plant of a Fretz-Moon continuous gas butt-weld furnace, to make butt-weld pipe ½-inch to 3 inches in diameter and in random lengths running to 45 feet.

The new mill will adjoin existing butt-weld mills at the tube plant. Republic will then have in Youngstown production facilities for gas butt-weld, old style conventional butt, lap weld and electric weld.

Fretz-Moon furnace patents are jointly owned by Republic and Spang Chalfant & Co. Inc., Pittsburgh, through Fretz-Moon Tube Co., Butler, Pa., which has two such mills. Steel for these mills has been furnished from Youngstown.

Republic has completed enlarging one of its open hearth furnaces in Youngstown and has started increasing capacity of another. The two will have about 175 tons capacity and will give the company four furnaces of such capacity in Youngstown. Ten of its 15 furnace units there have a capacity of about 125 tons and one of about 145 tons.

## River Shipments Gain

Shipments over the three rivers in the Pittsburgh district increased moderately in May, reflecting improvement in movement of coal following settlement of the strike. Total tonnages:

Steel Products			
	May 1939	April 1939	May 1938
Allegheny ...	2,900	5,950	488
Monongahela ...	59,150	55,850	38,450
Ohio ...	129,500	110,950	75,750
All Products			
	May 1939	April 1939	May 1938
Allegheny ...	136,000	100,600	155,547
Monongahela ...	661,100	348,100	1,082,973
Ohio ...	654,950	469,350	679,488

# PRODUCTION

STEELWORKS operations last week advanced 2 points to 54.5 per cent. Increases were noted in four districts and declines in three; five were unchanged. Year ago the rate was 28 per cent, two years ago 74 per cent.

**Youngstown, O.**—Gained 2 points to 54 per cent, 46 open hearths and three bessemer in production. This week Youngstown Sheet & Tube Co. will suspend its bessemer, reducing the rate to 51 per cent.

**Birmingham, Ala.**—Steady at 71 per cent with 15 open hearths in production.

**Wheeling**—Advanced 6 points to 79 per cent as one plant which had been idle several weeks resumed.

**Chicago**—Unchanged at 49.5 per cent.

**St. Louis**—Held at 42 per cent for the second week, with no marked change indicated this week.

**Cleveland**—Continued at 55.5 per cent.

**Central eastern seaboard**—Up 1 point to 38 per cent, highest since late April.

**New England**—Reduced 8 points to 32 per cent, one producer taking off all open hearths for two weeks.

**Pittsburgh**—Increase of 7 points to 47 per cent resulted from several plants adding open hearths.

**Buffalo**—Loss of 4.5 points to 39.5 per cent, due to dropping two open hearths.

**Cincinnati**—Declined 13 points to 60 per cent on a sharp reduction by one mill.

**Detroit**—Held at 57 per cent for fifth consecutive week.

## Foundry Equipment Orders Lower in May

Foundry equipment orders declined in May, while shipments increased, according to the Foundry Equipment Manufacturers' association, Cleveland. Comparisons follow, indexes based on 1922-24:

	May 1939	April 1939	May 1938
Net orders .....	108.8	146.0	90.6
Shipments .....	144.3	131.0	91.3
Unfilled orders .....	173.1	208.6	157.5
3 mos. av. gross orders	133.9	142.8	94.9

## Auto Figures Revised

Subsequent to its statement of automobile production for the week ended June 24, as reported on page 30, this issue, *Ward's Reports*, Detroit, revised its figures. Total output, it states, was 81,070. Ford produced 19,700 cars instead of 16,000, as previously reported. Figures for other companies were unchanged.



# MEN OF INDUSTRY

■ HARRY V. MERCER, advertising manager, American Rolling Mill Co., Middletown, O., has been elected vice president, Porcelain Enamel institute, Chicago. Mr. Mercer, a member of the Armco organization more than 20 years, has been closely associated with the institute's activities in recent years.

J. M. Seasholtz, J. M. Seasholtz & Sons Inc., Reading, Pa., has been elected to the institute board as a representative of its jobbing shop division.

Earl N. Graf has been named Pittsburgh district manager, John A. Roebling's Sons Co., Trenton, N. J., with headquarters at 855 West North avenue.

Donald P. Ordway, vice president, Sherman Mfg. Co., Battle Creek, Mich., has been elected president, to succeed Allan H. Warner Jr., who has resigned, owing to ill health. Mr. Ordway is also president, American Stamping Co., Battle Creek.

W. J. Westphalen, president and general manager, Laclede-Christy Clay Products Co., St. Louis, has been re-elected president, American Refractories institute, for the second consecutive term. Mr. Westphalen has been associated with the Laclede organization over 30 years.

John O. Outwater, who for many years represented the Steel Export Association of America in Europe, recently opened an office at Brettenham House, 14-15 Lancaster Place, London, W.C. 2, England, where he is sales representative for several American steel companies.

Ralph H. Pauley, vice president and treasurer, Pittsburgh Tool Steel



Harry V. Mercer

Wire Co., Pittsburgh, has been elected president, succeeding the late Alfred Stengel. He also retains the office of treasurer. Mr. Pauley is a member, American Iron and Steel institute, American Society for Metals, Wire association, and National Association of Manufacturers.

William H. Davey, chairman of the board, W. H. Davey Steel Co., Cleveland, sailed from New York last week for the British Isles where he will spend several months in the English and Welsh industrial centers.

James E. Gillespie, the past 12 years sales and advertising manager, Richardson Boat Co., Tonawanda, N. Y., has been appointed advertising and sales promotion manager, USL Battery Corp., Niagara Falls, N. Y., a division of the Electric Auto-Lite Co.

Thomas N. Berlage, formerly associated with the Standard Engineering Co. and Shell Oil Co., has been appointed director of sales, corrosionizing division of Standard Steel Spring Co., Coraopolis, Pa. Corrosionizing is a new process for coating steel for protection against corrosion.

E. W. Seeger, formerly in charge of the production engineering department, Cutler-Hammer Inc., Milwaukee, has been appointed manager, development department. P. B. Harwood, heretofore assistant in charge of production engineering department, has been made manager of engineering department. Joining the company in 1913, Mr. Seeger has been closely associated with the development of new apparatus, and holds a considerable number of patents on motor control apparatus. Mr.

Harwood, with Cutler-Hammer 20 years, is the author of numerous articles on electrical engineering subjects.

Reed R. Smith, who has represented Pittsburgh Steel Co., Pittsburgh, in the New York territory for several years, has been appointed assistant district sales manager for that territory, with headquarters at 500 Fifth avenue, New York. A. Voelker is district sales manager.

George E. Clifford, Los Angeles district sales manager, Republic Steel Corp., Cleveland, has been placed in charge of the consolidated Los Angeles sales organization of Union Drawn Steel division, Republic. Arthur C. Geldner, formerly district sales manager, Union Drawn, is now assistant district sales manager of the consolidated organization.

Hugo H. W. Beth, associate the Norton Co., Worcester, Mass., 34 years, will retire Sept. 1 as district manager. He will, however, continue with the company as a consulting engineer. Mr. Beth will be succeeded by Andrew B. Holmstrom, who has been general manager of the company's plant in England. Mr. Holmstrom joined Norton in 1920 and had charge of the erection and operation of the company's abrasives plant in the plant 6 area; was later in charge of the building of the English plant, later being works manager there and general manager.

K. K. Knapp, vice president and director, Gary Land Co., Chicago, United States Steel Corp. subsidiary, has been elected president. Knapp succeeds G. Cook Kimball, who recently made executive vice president, United States Steel Corp., Delaware. S. H. Cohn, associated with the land company over 20 years, since Jan. 1 serving as president.



P. B. Harwood



E. W. Seeger



s been made vice president. Ball continues as a director.

M. Simmons, chief engineer, General Cable Corp., New York, has been awarded an honor degree of doctor of engineering by Princeton university for his contributions in the electrical industry. He graduated from Princeton in 1911 with the degree of A. B. and received his E. E. degree there two years later. He has been in the cable field more than 25 years except for two and one half years in the army, during the latter part of which period he served as a member of the staff of General Per-

kins. Trust, traffic manager, district, United States Steel Corp., Pittsburgh, has been elected president, Traffic Club of Pitts-



C. W. Trust

Other officers are: First vice president, M. C. Richards, general manager, Spang, Chalfant & Co.; second vice president, C. C. Richards, general agent, Lehigh Valley railroad; third vice president, J. C. Richards, general agent, Louisville & Nashville railroad; secretary, F. Woods, general agent, Chicago & Eastern Illinois railroad; treasurer, J. G. Owston, division manager, Pittsburgh Plate & Co. Robert H. Miller, general agent, Pennsylvania railroad, has been elected a carrier on the board of governors, and following as industrial members on the board: E. C. Jepson, general manager, Wheeling Steel Corp.; John B. Keeler, assistant traffic manager, Koppers Co.; Ene Schiffer, traffic manager, Dil Corp., and John H. Wil-

son, traffic manager, Diamond Al-



Donald M. Simmons

activities of the Southwark division. A graduate of Case School of Applied Science, Cleveland, Mr. Tabors has been active in the development and sales of testing machines and hydraulic machinery manufactured by the corporation.

Marshall L. Havey has been elected a vice president, New Jersey Zinc Co., New York, and its subsidiaries. Ralph M. Neumann has been appointed general sales manager, and Arthur E. Mervine, assistant general sales manager. Mr. Neumann will continue as manager, pigment division, and Mr. Mervine, manager, metal division, New Jersey Zinc Sales Co.

L. C. Ricketts, the past ten years associated with Worthington Pump & Machinery Corp., Harrison, N. J., and recently general superintendent, Harrison works, has been appointed manager of that works. W. D. Sizer, who joined Worthington in 1920, has been named executive engineer in charge of all engineering activities at Harrison. B. R. McBath succeeds Mr. Sizer as engineer in charge of the centrifugal engineering division, and H. J. Brautigam succeeds W. H. Scherer as manager of the corporation's Holyoke works. Mr. Scherer will now devote his entire time to the further development of manufacturing methods in all of the corporation's plants, as assistant to H. C. Ramsey, vice president in charge of operations, with headquarters at Harrison.

## DIED:

■ ROBERT H. MADDOCKS, 73, assistant to general sales manager, Central Iron & Steel Co., Harrisburg, Pa., at his home in Jersey City, N. J., June 16. Mr. Maddocks' entire career was spent in the steel busi-

ness. At the age of 15 he started with William H. Wallace & Co., later becoming New York sales agent for Central. In 1914 when the company opened its own office in New York, Mr. Maddocks was made district sales manager, retaining that position until May, 1934, when he became assistant to general sales manager.

Frederick Auberle, for 22 years superintendent of Jones & Laughlin Steel Corp.'s hot mill at Aliquippa, Pa., June 12.

J. D. Hardcastle, 58, vice president, Spang, Chalfant & Co. Inc., Pittsburgh, in that city recently. He had been with the company 35 years.

Harry G. Boston, 56, Scully Steel Products Co., Chicago, in Chicago, June 17. Mr. Boston had been employed as a structural engineer by United States Steel Corp., subsidiaries 30 years. He was a member, Western Society of Structural Engineers.

Herbert L. Brown, 56, many years active in the steel industry in Cincinnati, at his home in West Chester, O., June 15. During his career, Mr. Brown served as district manager for Superior Steel Corp., and later was sales representative for Columbia Steel & Shafting Co. and Revere Copper & Brass Inc.

Roland M. Cook, 45, sales manager, Worcester Pressed Steel Co., Worcester, Mass., in that city, June 15. A graduate of Harvard university and later of Harvard Graduate School of Business Administration, he first was associated with the former Boston Pressed Metal Co., Worcester. He joined the Worcester Pressed Steel Co. in 1929.

William Douglas Price, 80, former superintendent of construction, International Harvester Co., Chicago, in that city, June 16. In 1881 Mr. Price entered the contracting business with his father, and from 1896 until his retirement in 1931 he was consulting architect for International Harvester, in charge of all building operations in the United States and Canada.

Alfred H. Renshaw, 78, chairman of the board, General Railway Signal Co., New York, in Darien, Conn., June 16. In 1899 he formed the Standard Signal Co., which was sold in 1903. Later he reorganized the Federal Signal Railway Co. of which he was president until its merger with General Railway Signal Co. He was vice president of the latter firm from 1924 to 1936 when he became chairman.



## Activities of Steel Users, Makers

■ **HONING** Equipment Corp., 4612 Woodward avenue, Detroit, has been formed to manufacture standard honing machines and tools and furnish engineering service. J. A. Carlin, president, was appointed receiver of Hutto Engineering Co. in 1930, became vice president and general manager when the receivership was lifted, and general manager when Carborundum Co., bought it. C. W. Floss, vice president in charge of engineering, was an organizer of the Jeschke Tool Corp., which later became Micromatic Hone Corp. J. A. Carlin Jr., for a number of years with the Hutto organization, is eastern representative at Philadelphia.

General Steel Warehouse Co. Inc., Chicago, has moved from 2445 North Keeler avenue to 1830-48 North Kostner avenue.

Philadelphia Gear Works, Philadelphia, has opened a branch office at 111 West Washington street, Chicago, with A. R. Herbert, district manager, in charge.

Ajax Steel & Forge Co., Detroit, has appointed Jackson-Alden Associates, Lincoln-Liberty building, Philadelphia, its representative in eastern Pennsylvania, eastern New York, New Jersey, Delaware, Maryland and Washington.

New Ledaloyl bearings placed on the market last year by Johnson Bronze Co., New Castle, Pa., now are being carried in stock by that

company's warehouses, and also by certain mill supply distributors. As a result, immediate delivery can be made to users who buy in small quantities. Stocking of these bearings, including more than 300 individual sizes, has been made possible by installing a large amount of tool and die equipment. The bearings are recommended for constant load applications.

Patterson Foundry & Machine Co. has started an improvement program at its East Liverpool, O., plant. Fifty thousand dollars is being spent for machine tools for company's machine division, and \$30,000 is being spent for additional machinery at its Porox division.

Mount Pleasant Metal Products Co., Mount Pleasant, Mich., has been opened as a division of the Ferro Stamping & Mfg. Co., Detroit, and is now actively engaged in production of stamped automotive hardware. Zinc plating facilities also are being operated at the new division.

Blaw-Knox Co., Pittsburgh, in order to better serve an expected demand for prefabricated steel products in Europe, has completed a manufacturing and selling arrangement with Societe Anonyme Ateliers de Tombay, a fabricating firm in Belgium, to produce certain Blaw-Knox products.

Open house at the Canton, O., plants of Timken Roller Bearing Co. was held from May 15 to May 19 inclusive. During that period nearly 15,000 people, comprising Timken employees and their families, went through the Timken roller bearing factory and the steel mill in organized groups at the rate of about 3000 persons per day.

## FINANCIAL

### CHAIN BELT MAY PURCHASE BALDWIN-DUCKWORTH

■ AT A SPECIAL meeting of stockholders of Chain Belt & Waukeee, will vote on a plan to acquire business, plants and equipment of Baldwin-Duckworth Chain Springfield, Mass., in exchange for 139,537 shares of common stock. Approval of the plan would necessitate an increase in authorized common stock to 510,000 shares from 370,000. In the first five months this year Chain Belt's net profit was \$108,257 after all charges. This is equivalent to a share on 347,595 shares of common stock outstanding. In the same period Baldwin-Duckworth net profit was \$108,257.

American Forging & Sock Co., Pontiac, Mich., reports net profit of \$25,895 in the third fiscal quarter ended May 31. Net sales during the period were \$462,714.

Wayne Screw Products Co., Detroit, for the six months ended March 31 had a net loss of \$10,000 after depreciation, amortization, interest, etc.

Pressed Metals of America, Inc., Detroit, Mich., reports net profit of \$140,842 in the March quarter. Depreciation but before federal income tax was \$10,000. Gross sales in the period were \$1,094,394, against \$362,010 in the same period in 1938 quarter.

### DIVIDENDS DECLARED

Laclede Steel Co., St. Louis, Mo., declared a quarterly dividend of 15 cents on common, payable June 30 to stockholders of record June 20.

Sharon Steel Corp., Sharon, Pa., declared a regular quarterly dividend of \$1.25 on preferred stock, payable July 1 to stockholders of record June 26.

Cleveland Hobbing Machine Co., Cleveland, 20 cents on capital stock, payable July 1 to record June 23. This doubles the former 10-cent share quarterly rate.

Briggs Mfg. Co., Detroit, 25 cents on capital stock, payable June 30 to record June 23. Similar payment was made March 30.

Independent Pneumatic Tool Co., Chicago, 25 cents on capital stock, payable July 1 to record June 23. Like payment was made in March.

Wayne Pump Co., Ft. Wayne, Ind., 50 cents on capital stock, payable July 1 to record June 20. Similar amount paid on April 1.

American Brake Shoe & Foundry Co., New York, 25 cents on common, payable June 30 to record June 23. Similar amount paid March 31.

Pacific Can Co., San Francisco, 12½ cents on capital stock, payable June 30 to record June 23. Similar amount paid in March.

## One-Ton Welded Crown, Tribute to Their Majesties

■ An impressive tribute to Britain's rulers from one of Canada's great industries took the form of this enormous crown, later raised to the tower of a pulp and paper company in time for the royal visit to Quebec. The crown, weighing 2000 pounds, approximately 20 feet high and 16 feet wide, was built of pipe, angle iron, and sheet metal, welded smoothly together by the oxyacetylene flame.

The decorative, heraldic effect of the fleurs-de-lis and military crosses along the top edge of the base was obtained by oxyacetylene flame-cutting steel plate, and welding to the assembly. Lighting fixtures were installed so the crown could be seen in outline at night. Photo, The Linde Air Products Co., New York.





## Machine Tool Show Oct. 4-13

NATIONAL Machine Tool Builders' Association has formally announced its fourth Machine Tool Show to be held in Public Auditorium, Cleveland, Oct. 4-13. In number of exhibits, and in importance in performance and demonstration of machine tools, this show is far to surpass the last one also in Cleveland. Previous shows had been held in this city in 1927.

More than six acres of exhibition space in the Auditorium, 100,000 square feet will be occupied by displays of exhibitors, ranging in area from 200 to 4000 square feet. 75 per cent of this space will be devoted exclusively to machine tools, the balance to accessories and miscellaneous items. Space has been subscribed for some weeks, and individual allotments have been

cut to hold the total within limits.

The number of machines on exhibit will run into the thousands, and their value into millions. To provide the required power to operate these machines, special power lines will be installed carrying 8500 horsepower connected load.

Manufacturers from all over the United States and many foreign countries are expected to visit the show. Admission will be by registration at a fee of \$1.

A Machine Tool congress, providing a series of evening meetings, will be held during the show period. Organizations which will participate in the congress are: American Foundrymen's association, American Society of Mechanical Engineers, American Society of Tool Engineers, Associated Machine Tool Dealers of America, Cleveland Engineering society, National Electrical Manufacturers' association, National Foremen's association, Society of Automotive Engineers, and National Machine Tool Builders' association.

## "Industry Ready For War Demand"

■ THAT 10,000 industrial plants in the United States are prepared to start manufacture of munitions immediately in case of war was stated by Louis Johnson, assistant secretary of war, to the convention of the Advertising Federation of America in New York, June 20.

A survey of industry by the war department, including visits to more than 20,000 plants, revealed facilities to manufacture practically all military equipment.

"As a result of these surveys," he said, "we selected 10,000 plants to which we gave definite schedules of production. If tomorrow were mobilization day we could turn to these plants, give them an order and they would begin at once to manufacture munitions."

Referring to the war department's educational order program, he said: "We have placed a number of such orders already and expect to multiply them during the next year. With the aid of such a policy we are confident that industry will be able to go into production on a preponderant number of our needs within six months after mobilization day.

"To equip our army, we need 70,000 different items. The vast majority are commercial, easily obtainable in the open market. There are, however, about 3700 that present special problems. Of these, 2500 are in ordinary commercial use but demand for them in quantity, in time of war might become so great as to impose a burden on industry."

To meet such an emergency production schedules have been worked out by conference with industry to assure sufficient supply.

## "Segregate Scrap, Aid Handling Problem"

■ Metalworking plants and other producers of scrap iron and steel can assist in solving some of the scrap industry's problems by more carefully segregating various types of scrap, Edwin C. Barringer, executive secretary, Institute of Scrap Iron and Steel Inc., New York, declared in addressing the summer conference of the Foremen's Association of Erie, Pa., June 24.

Especially in the handling of alloy-bearing steels is segregation necessary, he said. Scrap yard employees at 50 and 60 cents per hour obviously cannot be metallurgists and the detection of alloys is easiest done at the point where the scrap is generated.

## Select Most Beautiful Bridges of 1938



American Institute of Steel Construction, New York, has announced its results in its eleventh annual contest for most beautiful bridges. Only bridges completed and opened to traffic in 1938 were eligible, in three classes: Monumental, costing \$1,000,000 or more; medium, \$250,000 to \$1,000,000; small, less than \$250,000; movable bridges.

The Middletown-Portland bridge, Middletown, Conn., costing \$3,000,000, designed by Bethlehem Steel Co., Bethlehem, Pa., was selected by a committee of engineers and architects as the most beautiful in the monumental class.

The bridge crosses the Kentucky

river at Frankfort, Ky., costing \$329,316, also fabricated by Bethlehem, won top award in the medium-size class. Bridge over middle fork of Flathead river, Bolton, Mont., costing \$74,815, fabricated by Pittsburgh-Des Moines Steel Co., Pittsburgh, was first in the small class.

Lafayette avenue bridge across east channel of Saginaw river, Bay City, Mich., costing \$380,000, fabricated by R. C. Mahon Co., Detroit, was first among movable bridges.

Illustration shows Middletown-Portland bridge, winner in the monumental class. Pictures of other winners will be presented in subsequent issues of STEEL.



# EAGLE MUSIC WIRE



IS HANDLED  
WITH GLOVES

Washburn wire makers are skilled craftsmen who have been schooled by long experience in the highest standards of quality workmanship. Talent and the most up-to-date equipment produce clean, uniform wire . . . straight throughout the coil, and held to close tolerances in all physical requirements.

The operations of making Eagle Music Wire are exercised

with extreme care. To maintain a bright, clean surface the finished wire is handled with gloves to prevent oxidation marks which lead to rust and finally to surface pitting.

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CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RO  
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WI



# Windows of



# WASHINGTON

By L. M. LAMM  
Washington Editor, STEEL

## WASHINGTON

COMMENDED to congress week by President Roosevelt new \$3,060,000,000 spend-lend m. Of this, \$870,000,000 be available during the fiscal 1940.

Roosevelt suggested \$500,000, railroad equipment over a year period, with \$100,000,000 available during the coming year. He proposed the purchase of all types of railroad equipment which would be leased to the government at a rate adequate to return the government over a long period. Carriers would have option on the leased equipment. This requires legislation organizing holding company under the

President outlined also a four-year program for express post roads totaling to \$750,000,000, of which \$10,000 would be available next year. This provides self-liquidating roads, bridges, high-speed highways and city bypasses.

At a special press conference announcing the plan he stressed the importance of all of the proposed projects being self-liquidating.

Proposed by Mr. Roosevelt were appropriations for federal agencies, agriculture, including rural electrification and farm machinery, and foreign loans.

## TE PASSES BILL TO REVERSE TAXES

At last week passed without a dissenting vote the new revenue bill reversing broad tax revisions.

The amendments were the only changes in bill's original provisions (STEEL, June 19, p. 33). The bill set a penalty of fine and imprisonment for selling a list of taxpayers; and extended to Samoa and certain tax credits allowed to residents in Puerto Rico.

The house, which previously had passed the bill, concurred in amend-

ments, completing legislative action.

It is necessary that the bill be signed by the President and become law by June 30, otherwise the government will lose about \$1,000,000 a day in excise taxes expiring on that day. At a press conference last week, Mr. Roosevelt indicated he was pleased with the bill, and unless something unforeseen develops, there is little doubt it will receive his signature before June 30. So far as can be learned, no major tax bill has ever been rushed through congress in less time than this.

## HEAR CASE AGAINST LABOR RELATIONS ACT

Senate committee on education and labor, considering amendments to the national labor relations act last week, heard John C. Gall, counsel for National Association of Manufacturers, state inequalities of the act are contributing directly to industrial discord, and that the national labor relations board had been "guilty of perverting" the statute.

"The board claims," said Mr. Gall, "it is not infringing the right of free speech. If this is true, the board should not object to a clear provision in the act preserving that right against possibility of abuse by future boards."

"The board says it has no prejudice against independent unions, unaffiliated with the CIO or the AFL. If this is true, it should not object to the amendment by Senator Ellender, which, under those circumstances, is merely declaratory."

"If the board does not in any way discriminate against men because they have exercised their right to remain unaffiliated with unions, there should be no objection to stating the right to join or not to join, as does the Norris-LaGuardia act."

"If the board is complying with fair rules of procedure, fairly applied, in conducting investigations and hearings, and holding elections,

it should not object to having those rules laid down for the guidance of all concerned, including future boards."

"If the board accepts fully the decisions of the Supreme Court in the *Fansteel* and *Columbian* cases, it should, in the interest of labor, prefer to see the rule of those decisions written into the act, so that future boards may not give them an unwarranted interpretation."

In all these respects, he said, the provisions of the amendments proposed by Senators Burke, Walsh and Ellender, which the association is supporting with minor reservations, would be merely declaratory of present law and procedure.

At the outset, Mr. Gall told the committee the association represents 7500 manufacturers, large and small, throughout the country, and that they in turn represented several million workers.

The association is "firmly convinced" that the act and its administration "leave much to be desired." Mr. Gall stated:

## Must Win Public Confidence

"There is throughout the business world a conviction that the national labor relations board and its agents have been intensely pro-CIO, that they have been hostile to employers, to independent unions and to employees not affiliated with national unions, that they have violated many elementary principles of fair play, and that they have not only not contributed to a reduction of the volume of labor disputes, but have in fact sown the seeds of future discord."

"If this state of mind is justified, as we believe it to be, the situation seems to call for such revision of the act and such safeguards in administration as will win for the act and whatever board administers it, the public respect which is now lacking. Without the confidence of all affected groups, it is unlikely that



any agency of government can function successfully."

## COMMITTEE CAUTIOUS ON INCENTIVE TAXATION

Special senate finance subcommittee which has been studying existing profit-sharing systems between employers and employees with an eye to incentive taxation, reported last week that some prudent experiments in incentive taxation could be undertaken in a spirit of exploration and experiment. Its 351-page report was signed by Senators Herring, of Iowa, and Vandenberg, Michigan.

Committee stated it does not believe it practical to apply incentive taxation to the profit-sharing motive; at least "not until the theory and principle of incentive taxation has been more deeply experienced, and perhaps subjected to preliminary experiment.

### Opinion Divided

"Opinion respecting incentive taxation is sharply divided both in the committee and in the country. One school of thought insists that the taxing power should never be used for either incentive or punitive purposes and that one is the complement of the other."

The other school of thought insists that "we already have the punitive tax and that, confronting a condition rather than a theory, we should also have the incentive tax either as an offset or a substitute. In the latter field of action, serious consideration has been given to incentive taxation, which by compensatory tax exemptions and tax rewards could, for example, encourage plant expansion and equipment replacements in industry."

Asserting that profit-sharing had two major objectives, insurance of employment income, or job security, and financial security in old age, the committee recommended the adoption of a plan under which both workers and employers would contribute. A stipulation was included that the trustee should be required to disburse a portion of the fund to guarantee livable wages in periods of partial or complete unemployment.

Such a plan, the report added, would "make capitalists of the workers, completely changing their thinking and attitude toward the industrial system—an imperative national need."

Touching upon what it called the "waste" and "disruption of national economy," caused by labor disputes, the committee said strikes had cost the nation \$2,470,000,000 in 1937 and \$7,114,000,000 in the five years of 1933-37.

The committee contended that business would be helped if these

changes were made in tax legislation:

1. Specific tax credits for increased employment, when such employers are engaged in other than capital expenditure projects.

2. Reasonable exemption from taxation of expenditures for plant expansion, new enterprises, and improvements to existing facilities.

3. Exemption from capital gains tax and increase in deduction for capital losses of gains and losses realized by first purchasers of securities issued to finance new enterprises, expansions or improvements.

4. Carry-over of losses attendant upon operation of new enterprises or development by existing organizations of new products.

5. Increase in deductible allowances for depreciation and obsolescence.

6. Carry-over of credits for capital expenditures.

7. Carry-over of losses in connection with guaranteed-annual-employment plans.

8. Deduction for severance payment reserves.

9. Exemption from capital gains and income taxes of profits on bonds purchased at a discount for retirement from funded debt accounts of railroads and operating public utilities.

## WILL ASK \$25,000,000 FOR STRATEGIC STOCKPILES

President Roosevelt held a conference last week at the White House regarding an appropriation for strategic war materials as provided in the act passed recently by congress. That was an authorization act and did not actually appropriate money.

Following the conference, it was said they decided to ask for \$25,000,000 for the fiscal year beginning July 1, for stockpiles. The materials to be purchased under the appropriation, when and if it becomes available, was decided at the conference, but was not disclosed.

## WALSH-HEALEY PURCHASES

During the week ended June 17 the government purchased \$520,002.72 worth of iron and steel products under the Walsh-Healey act as follows: Camden Forge Co., Camden, N. J., \$89,902.80; National Tube Co., Washington, \$11,845.75; Midvale Co., New York, \$13,825.54; Pennsylvania Forge Corp., Philadelphia, \$53,680; Allis-Chalmers Mfg. Co., Milwaukee, \$44,489; Struthers Wells-Titusville Corp., Titusville forge division, Titusville, Pa., \$42,560; Breeze Corporations Inc., Newark, N. J., \$50,333; Noland Co. Inc., Washington, \$12,326.37; Dravo Corp., Pittsburgh, \$22,567.50; Albert & Davidson Pipe Corp., Brooklyn, N. Y., \$10,713.91; Lukens Steel Co.,

Coatesville, Pa., \$16,098.43; Cation Engineering Co. Inc., York, \$24,237.99; Columbia Co., San Francisco, \$112; Electro Metallurgical Sales New York, \$14,786.83.

## Officers Nominated by Mechanical Engineers

■ Warren H. McBryde, cor engineer, San Francisco, has nominated for president of American Society of Mechanical Engineers for 1940 to succeed Ader G. Christie, professor of mechanical engineering, Johns Hopkins University, Baltimore. Mr. McBryde now completing a two-year term as vice president.

Four vice presidents were nominated as follows: Kenneth F. Hedit, consulting editor, *American Machinist*, New York; Francis M. Kinson, honorary professor of mechanical engineering, Columbia University, New York; J. C. Saker, head of department of mechanical engineering, Massachusetts Institute of Technology, Cambridge, Mass.; and K. M. assistant to vice president in department of engineering, Philadelphia Electric Co., Philadelphia.

Nominees to serve as managers for three years: J. W. Eshelman, president, Eshelman & Potter, Birmingham, Ala.; Linn Helander, head of mechanical engineering department, Kansas State college, Manhattan, Kan.; and G. T. Shoemaker, president, United Light & Power Co., Chicago.

Selections were made by the nominating committee at a meeting at State College, Pa., recently. Elections will be by letter ballot closing June 26, with nomination virtually final by election.

## McKee & Co. Show Wide Scope of Their Work

■ Arthur G. McKee & Co., engineers and contractors, Cleveland, have issued a catalog containing views of domestic and foreign plants and equipment designed and constructed by the company in recent years.

It includes halftone views of furnaces, petroleum refineries, power apparatus and power plants. In addition to projects in the United States the illustrations show done in France, India, Germany, England, Russia, Rumania, Wales and Czechoslovakia.

■ The Galvanizers' committee sponsored by the American Zinc Institute, 60 East Forty-second street, New York, has tentatively scheduled its next meeting in Pittsburgh in November.



# ATION

## MENT NEEDS FOR AIR EXPANSION PROGRAM

TANTIAL equipment buy- anticipated under the navy's a for expanding its air bases nited States and possessions. al is the project for a new Kodiak, Alaska. Construc- to get underway this year, uire: Two seaplane hangars, ; airplane and engine shops, ; gasoline storage and distri- \$250,000; underground stor- 80,000 barrels fuel oil, \$150,- ower plant and equipment, ; water supply and fire pro- \$300,000; and bomb and tor- ops, \$40,000.

ral awards for aircraft and s continue in large volume. ative order for nearly 100 com- ones costing about \$2,500,000 eek went to North American on Inc., Inglewood, Calif.

tracts for two-place, single- bobservation craft were re- by Stinson Aircraft division ation Mfg. Corp., Wayne, \$1,500,000; Bellanca Aircraft New Castle, Del., \$50,000; and Aeronautical Co., San Diego, l. Wright Aeronautical Corp., son, N. J., booked an engine amounting to \$508,269.

uch air ministry last week a contract with United Air- Pratt & Whitney division, Hartford, Conn., for airplane

engines and propellers costing \$5,- 400,000. This brings to \$19,400,000 its allotments to American engine builders since the first of the year. France also has signed a contract for 40 seaplanes with a domestic manufacturer, said to be Consoli- dated Aircraft Corp., San Diego.

A new record for monthly airplane deliveries was established in May by Piper Aircraft Corp., Lock Haven, Pa., with 201 units, compared with 56 for the same month in 1938. Building the "Cub" lightplane, Piper is accounting for nearly half of current private craft production.

### Adding Aluminum Capacity

Aluminum Co. of Canada Ltd. has launched a \$7,000,000 expansion pro- gram involving extension of its Arvida and Shawinigan plants and construction of a mill at Kingston, Ont. Reported awaiting completion of the new facilities are British or- ders approximating \$13,500,000 for aluminum in finished form to go in- to warplanes. The expansion is ex- pected to make Canada's aeronauti- cal industry independent of outside sources for the processed metal.

Recently installed for testing on a pursuit plane at Wright field, Day- ton, O., was a four-blade control- lable propeller, believed the first built in this country. Made by Cur- tiss Propeller division of Curtiss- Wright Corp., Clifton, N. J., it has duralumin blades with a constant- speed hub. Use of units with four or more blades is said to benefit op- erating efficiency at high altitudes.

## Tells Story of Roller Bearings

NEW YORK

■ TIMKEN ROLLER BEARING CO.'S exhibit in the Metals building at the World's fair features the forty-first anniversary of roller bear- ings, illustrates the great advances in transportation in the past genera- tion. Included are the "largest model bearing in the world," a mu- seum with one of the first "horseless carriages," a series of dioramas and moving displays.

To indicate how friction is reduced by roller bearings, company has set up two model locomotives on tracks, enclosed in glass. The "man power" required to pull one model is repre- sented by 33 miniature red caps. The other model, equipped with roller bearings, requires only three red caps to haul it.

A hair-measuring device demon- strates Timken products' precision. Visitors may place a hair in a slot, press a button, receive a card show- ing the hair's exact diameter. The machine has been so popular that a duplicate is being constructed. Two artists' models keep visitors in line, explain how the device works.

### Large Working Model

An impressive item is a huge model roller bearing, 9 feet, 9 inches high, which rolls back and forth at the top of the exhibit. In the center is a painting showing an artist's conception of tomorrow's streamlined vehicles.

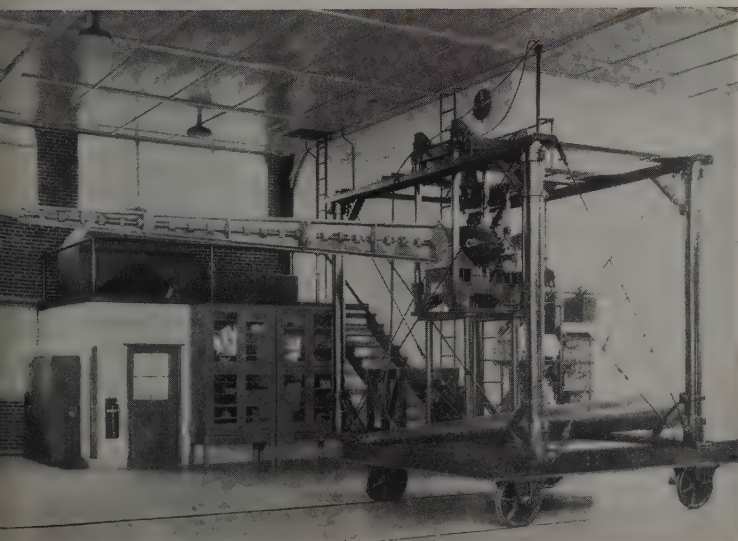
Simple construction of Timken bearings is illustrated by a 12-inch model that separates into its com- ponent parts, then re-assembles it- self magnetically. It shows the tapered rollers, the raceways on which the rollers turn, the cage which se- parates them and prevents internal friction.

Another feature is a diorama of the company's steel mill. Capable of producing 30,000 tons of high grade electric furnace or open-hearth alloy steel monthly, it is one of the largest of its type in the industry. Plant's electric furnace is capable of 100 tons per heat.

A model "feed train" on a circular track drags labeled cars into the mill and shows the exact proportions of materials that make up 100 pounds of Timken company's "high dy- namic" steel.

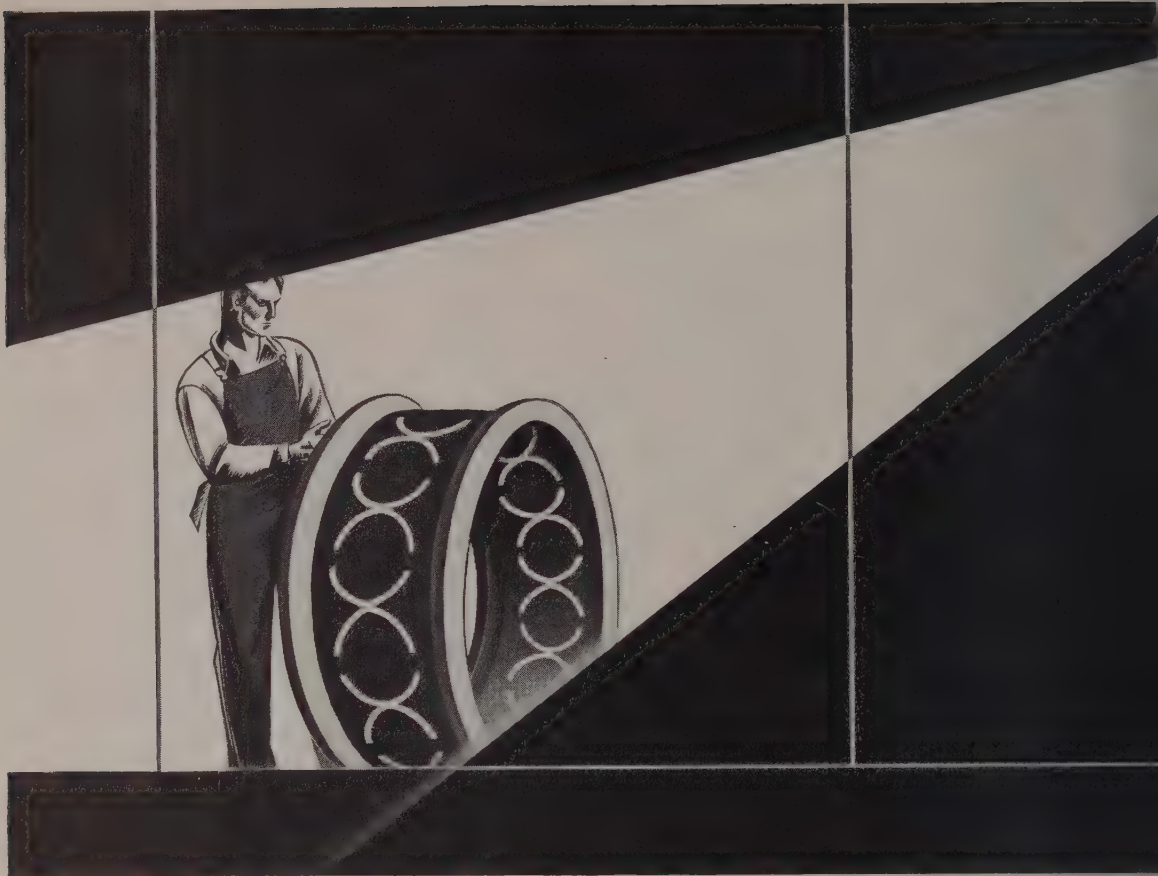
Visitors have evinced particular interest in the early "horseless car- riage." Converted from a horse- drawn buggy in 1898, it still has a buggy whip holder, runs on original bearings, one of the first Timken in- stallations for use in an automotive conveyance.

## Testing Propellers for Air Corps



propeller models are tested with this equipment by air corps research engi- at Wright field, Dayton, O. Revolving propeller is held in a 5-foot wind by steel arm containing a motor-operated drive shaft. Instruments record its performance. Official photograph U. S. army air corps





## MEETING THE UNUSUAL...

Exceptional service requirements bring unusual problems, demand modern materials.

Consider, for example, the case of a manufacturer of textile braiding machines. Two cylindrical carrier head castings made unusual demands. They are 5 feet in diameter, weigh 850 and 1450 pounds respectively and have curved slots in which the carriers travel at high speed. Therefore unusual wear resistance was required. Furthermore, in addition to high strength, extreme accuracy in the finished casting and freedom from strains was essential.

The manufacturer found exactly the required mechanical and fabrication qualities in Chrome-Molybdenum Cast Iron—the necessary hardness and strength, machinability and dependable response to stress relief treatment after machining.

Rechecking your own material specifications will disclose places where Molybdenum Iron will produce better results, or lower costs, or both. Our technical book, "Molybdenum in Cast Iron", will be sent on request to production executives and engineers interested in better iron.

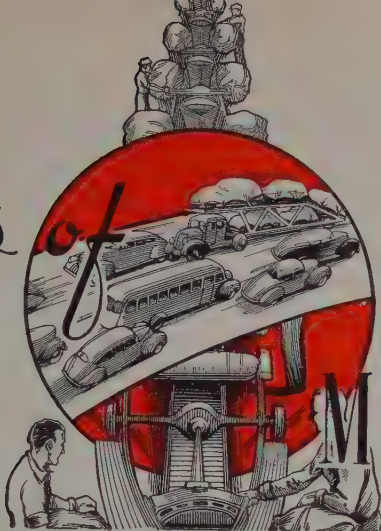
PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDENUM

**Climax Mo-lyb-den-um Company**  
**500 Fifth Avenue • New York City**



# Mirrors of MOTORDOM

By A. H. ALLEN  
Detroit Editor, STEEL



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**DETROIT**  
This week will mark the start of a new line in automobile production as plants swing into model change-over periods. Packard has completed production of all 1939 models and is now in process of retooling plants, with the hope that output of 1940 models can be initiated along with the end of July.

Pontiac took final shipments of 1939 parts for the current series this Friday, indicating assembly lines will begin to taper off this week. Chevrolet models may be coming off the line by the third week in July, certainly by the first of August. Pontiac and Olds likely will have new models going out to dealers by the first of August, suggesting current production will be extended through the end of July.

Pontiac announced termination of production at the end of last year and work will be started immediately on retooling of plants in Detroit and Milwaukee. Expenditure of about \$700,000 is involved, considerably less than the \$2,500,000 reported to have been allocated for introduction of 1939 models.

## Olds Maintains Production

Olds has several weeks more of production before the store for Chrysler divisions, but first, to make up for time encountered during the strike, and second to meet the brisk demand for cars noted throughout the industry for the first half of this month. Plymouth will be the first of the new units to go down for good.

Pontiac and Chevrolet continue to be in high gear on 1939 models. Pontiac's 1940 models will be among the first to go through the transition period. Generally speaking, the picture is much the same as it was last

summer, with Buick and Packard in the vanguard of new model activity, and Ford and Chevrolet holding on to the volume markets until the latest possible date.

Figures on June sales are encouraging. Chevrolet reports a record-breaking first ten days, 62.1 per cent ahead of the same period last year. Total of 23,653 cars and trucks sold tops every previous first ten-day period this year and reverses the usual trend in June sales. Used car sales also held up well for Chevrolet dealers, totaling 47,218 or 29.7 per cent ahead of last year. Other makers show comparable improvement over last year—Pontiac 66 per cent and Buick 42 per cent.

■ **SPRINGING** is always a live (no pun intended) subject among chassis engineers and suspension experts. While the trend toward coil springs has been predominant in recent years, it is by no means an established fact that coil springs are cure-alls for riding qualities in automobiles. When Buick and Olds adopted coil springs for rear wheels there was talk the day was not far off when all cars would have four individually sprung wheels. Considerable doubt exists on this score.

Coil springs unquestionably are much softer in their action than leaf springs, and because of this fact have necessitated the expenditure of considerable sums of money for improved and stiffer shock absorbers to counteract this softness, as well as for fairly complicated systems of stabilizer bars and rods to eliminate sidesway and maintain axle alignment. And as good as the coil spring may be, still it does not have the insulating or dampening properties against tire noise provided by conventional leaf springs.

Reports from drivers of cars equipped with coil springs in the

rear occasionally bring out the fact that noise and vibration from rear wheels appear to be transmitted too strongly to the frame and body. Some complaints also are heard of the difficulty of handling cars with this type of suspension in a stiff cross wind.

These objections are not serious, of course, and could be overcome with suitable refinements in design, which are quite likely to come. Certainly there will be no general abandonment of the coil spring suspension idea, in view of the estimated \$25,000,000 spent by the auto industry in advertising and promotion of "knee-action" and "individual springing." Nash, for example, is switching to coil springs on front wheel suspensions for 1940 models, avowedly with the idea of "cashing in" on this heavy promotion expenditure.

## Studying Steel-Rubber Spring

Pontiac has steered clear of rear coil springs, but has improved riding qualities with its "duflex" or variable-rate leaf spring which, according to all reports, has been highly satisfactory. Some months ago it appeared likely the variable-rate spring would be extended to other passenger cars for 1940, but at the moment no such plan is being contemplated.

Spring engineers are intrigued with possibilities of the combination of rubber and steel in B. F. Goodrich's torsilastic spring, now being put through its paces on test cars. This unit essentially is a torsion-type spring having an inner shaft of steel surrounded by an annular layer of rubber, with a steel shell around the outside, the rubber being intimately bonded to both the shaft and the shell. For automotive applications, the outer shell is split into two 180-degree segments to per-



mit high pressures to be applied to the bond between rubber and steel during the curing process, also to allow the rubber to shrink after curing without causing internal tension, and to permit placing the rubber and rubber-to-steel bond under radial compression by forcing the split shell down to a somewhat smaller diameter than in its free, cold state.

The torsilastic spring is stressed in torsion by anchoring either the shaft or the outside shell to the chassis and rotating the other member. The springs are said to be inherently resistant to any sort of misalignment and are well suited to serve not only as an elastic medium or spring but also to form a bearing or locating device for the wheel support arms or linkage.

A number of advantages are claimed: Reduction in harshness of ride; lowered noise level; elimination of bearings, spring seats, mountings and the like; freedom from lubrication, rattles and squeaks; cleanness and simplicity of design with low weight; no possibility of sudden failure in the rubber; and reduction of impact loads on suspension members due to the rubber forming its own bearing.

#### Other Applications Seen

Such a spring may be adapted in any one of several ways to automobile chassis, and also has interesting possibilities in railroad and street car suspension, as well as in mountings for heavy machinery.

It may properly be questioned as to whether the rubber layer would retain its original springiness under the repeated twisting to which it would be subjected; also whether exposure to mud, oil, salt, gravel and all types of atmospheres might not have a deleterious effect on the rubber. Road tests of course will ultimately supply the answers.

It is possible to use the torsion idea for springing without any rubber, that is, by using a solid bar of steel in torsion. Springs of this type are said to be used to some extent on certain types of buses.

■ A GOOD many industrial plants throughout the country, located in densely populated centers, have bumped into a complicated problem when resident neighbors have entered complaints, real or fancied, about fumes, smoke, noise or other disturbances claimed to originate in the plant. Such complaints cannot be ignored, if only for the consideration of the goodwill involved, but they serve residents as a nice handle with which to pry loose reductions in taxes on nearby property.

Noise is usually one of the chief

complaints. Residents here in the neighborhood of the De Soto stamping plant have been claiming they could not sleep because of the steady pounding of power hammers in the plant. Reductions in tax assessments were obtained and the protests were carried to plant officials. Seismographs and other sound detectors were taken out to the plant and careful determinations made of noise level.

Company attorneys say recordings prove the noise level to be

### Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.....	399,186	227,130	353,946
Feb.....	383,900	202,589	312,141
March....	519,022	238,598	389,489
April.....	553,231	238,133	354,263
May.....	540,377	210,183	*306,000
5 mos. . .	2,395,716	1,116,658	*1,715,839
June.....	521,153	189,399	.....
July.....	456,909	150,444	.....
Aug.....	405,072	96,936	.....
Sept.....	175,630	89,623	.....
Oct.....	337,979	215,296	.....
Nov.....	376,629	390,350	.....
Dec.....	347,349	407,016	.....
Year . . .	5,016,437	2,655,777	.....

\*Estimated.

Estimated by Ward's Reports

Week ended:	1939	1938†
May 27 .....	67,740	45,120
June 3 .....	32,445	26,980
June 10 .....	65,265	40,175
June 17 .....	78,305	41,790
June 24 .....	77,370	40,918

†Comparable week.

	Week Ended	
	June 24	June 17
General Motors .....	30,160	31,910
Chrysler .....	22,650	22,900
Ford .....	16,000	15,500
All others .....	8,560	7,995

less than that of a passing street car, but nevertheless a complete program of noise elimination has been initiated in the plant. First step was to close windows; then attempts were made to improve the mountings of machines which were notorious noise offenders.

Meanwhile, last week, police and residents cocked their ears outside the plant to determine whether it was possible to get some undisturbed sleep. Neighbors appeared to be in agreement they can now snooze unruffled.

Delving through the records, Packard engineers have discovered a design originated 33 years ago which provided for shifting gears by means of two levers attached to the steering column, one lever for reverse gear, and the other for the three forward speeds. The levers actu-

ated hollow shafts enclosed steering post and levers at to the lower ends of these moved rods by means of gears were shifted. It was adopted as standard equipment.

Of more recent vintage is a passenger limousine on wheelbase with three seats having individual side doors, developed by Packard in co-operation with American Airlines and the Motor Co. for carrying passengers and from airports located near cities.

As an adjunct to its group insurance plan, under which 90 per cent of its employees contribute \$1.00 a month for life insurance, accident and accident benefits, General Motors Corp. has announced availability of a group hospitalization and medical benefits plan requiring contribution of an additional 75 cents monthly for daily hospitalization of \$4 for up to 70 days, and benefits of \$10 to \$150 and hospital services of \$20. It is in force when 75 per cent of employees have enrolled. The group insurance plan is said to be the second largest of its kind in the country, exceeded only that of United States Steel Co.

Preview and private demonstration of the new Ford tractor incorporating the Ferguson power take-off and system of mounting, will be held June 29 at the born Inn.

Edward G. Budd Mfg. Co., Philadelphia, fabricator of automobile bodies and streamlined equipment, has been awarded a contract for sheet metal work by Willys-Overland Motors Inc., O. This previously had been awarded among several stampers will be assembled at the Budd plant and shipped to the Willys plant in Toledo, where they will be trucked.

### Nearly Pure Iron for Alloy Steel Research

■ Several one-pound ingots containing only 0.01 per cent impurities have been prepared in the metallurgical division, Bureau of Standards. Most of the impurities retained were non-metallic, such as oxygen and sulphur, with traces of carbon, phosphorus, nitrogen and hydrogen.

The ingots will be utilized for the direct determination of fundamental properties of iron and steel, and properties of alloys. Recent demand for new and improved steel to meet modern engineering requirements has called for this research, the bureau announces. Such pure metal is sufficient only for the already planned.





# CHECK YOUR PRODUCTS

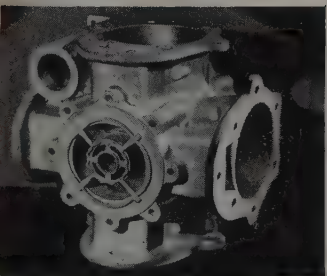
## *with this Quiz*



Do your products possess sufficient sturdiness to give the consumer a feeling of sturdy, solid construction?



"Slap the radiator grille with your hand. It's typical of the sturdy construction throughout". This is a selling sentence commercially used by dealers whose cars are ZINC Alloy Die Cast grilles.

ZINC ALLOY  YOUR PRESENT   
DIE CASTINGS PARTS



Are you sure that your machining and assembling operations are reduced to an absolute minimum?



Irregularly shaped and intricately cored, a meter body for a gasoline pump could be produced — in one piece — as a ZINC Alloy Die Casting. Other methods of production would have entailed more parts, more machining, boring, grinding and assembling.

ZINC ALLOY  YOUR PRESENT   
DIE CASTINGS PARTS



Q Can you point with pride to the finished appearance of your products?

A The modern appliance must "look expensive" to sell. That this may be accomplished at low cost is indicated by the attractive appearance of the illustrated coffee mill, which utilizes 3 ZINC Alloy Die Cast parts.

ZINC ALLOY  YOUR PRESENT   
DIE CASTINGS PARTS



Q Are your product design possibilities limited by your present manufacturing materials and methods?

A The flexibility of design offered with ZINC Alloy Die Castings is illustrated by this telephone booth fan. Although the die cast main housing has a trim, smooth-surfaced exterior, the interior has integrally cast lugs and bosses to facilitate the assembly of the auxiliary parts.

ZINC ALLOY  YOUR PRESENT   
DIE CASTINGS PARTS

The advantages of ZINC Alloy Die Castings are numerous — too numerous to cover in a single advertisement. If you are in any way concerned with the design, manufacture, or sale of metal parts, you should have the *whole* story on this modern fabricating material and process. Consult any commercial die caster — or write to The New Jersey Zinc Company, 160 Front Street, New York, N.Y.



# ZINC

## ALLOY DIE CASTINGS

Research was done, the Alloys were developed, and most Die Castings are specified with

# HORSE HEAD SPECIAL ( 99.99+ % ) ZINC

Uniform Quality



# ANNIVERSARIES

## FARM TO FACTORY

■ **KEYSTONE 25-YEAR CLUB**, Keystone Steel & Wire Co., Peoria, Ill., held its annual dinner June 16. It numbers 50 active members with a quarter-century or more service.

Company was organized 50 years ago by Peter Sommer and sons, John and Peter. W. H. Sommer, president, is another son and younger members of the family are officers and directors. Seeking means for making woven wire farm fence for his own use, Peter Sommer developed a machine which led the family from farming to manufacturing.

## VETERANS AT BANQUET

Farrel-Birmingham Co. Inc., Ansonia, Conn., at its third annual service banquet June 6 entertained 130 employees having 25 years or more service. A diamond-studded watch charm was given Edwin Van Ripper for 60 years, and a gold watch

to replace one given him ten years ago, which was stolen. A 50-year watch was given James Dunn and a 25-year pin to John Walter.

Of 142 veterans 62 have been employed 25 to 29 years, 31 from 30 to 34 years, 16 from 35 to 39 years, 18 from 40 to 44 years, six from 45 to 49 years, and nine for 50 years or longer.

## CONTEST AT SEVENTY-FIVE

Jenkins Bros., Bridgeport, Conn., manufacturer of valves, packing and mechanical rubber goods, celebrating its seventy-fifth anniversary, conducted a contest for finding its valves in long service. Six prizes of a visit to the New York World's fair have been awarded, and a trip to Montreal, Quebec and Nova Scotia for the winner in the New York area.

## NEW DEPARTURE FIFTY

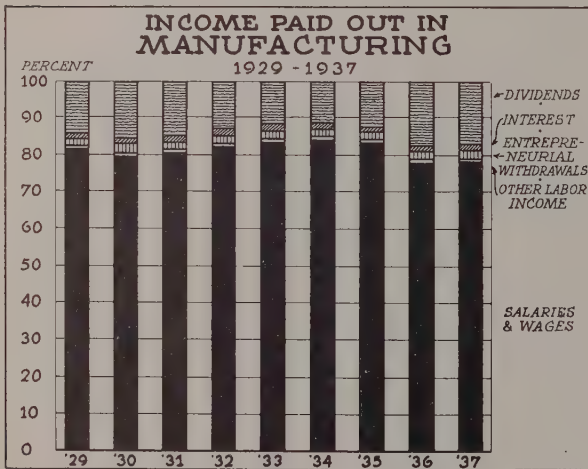
New Departure division, General Motors Corp., manufacturer of ball bearings at Bristol and Meriden, Conn., will observe its fiftieth an-

niversary June 27 by combining Old Timers' party with a dinner for foremen and executives at Compounce, Conn. Address made by A. P. Sloan Jr., chairman and W. S. Knudsen, president of General Motors. F. G. Hughes, manager of the division, will present watches and gold service buttons. Four hundred, ninety employees have been with the company 20 years or more.

## National Income Do Ten Per Cent in 1938

■ First authoritative estimate of individual income in the 48 states and District of Columbia in the base year 1938 were released last week by National Industrial Conference board, New York, based on a survey by its division of industrial economics. The survey, which includes breakdowns of individual income from wages, salaries, dividends, rents, royalties, pensions and the like, for the nation as a whole and for each of the states, and per

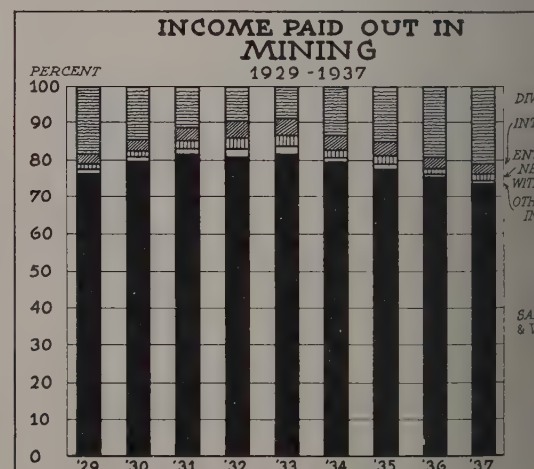
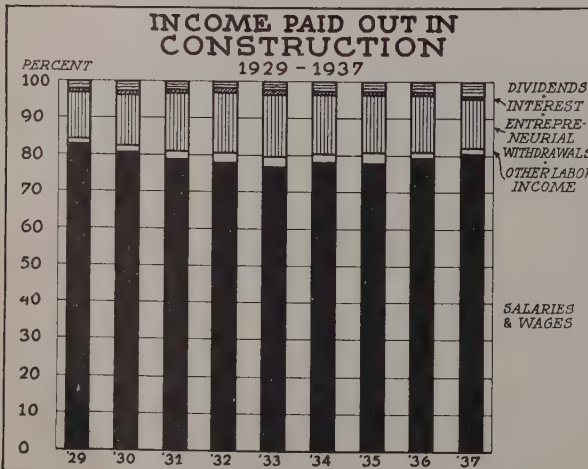
## Workers' Share in Business Income, as Illustrated



■ HOW the worker shares in business income is graphically illustrated in the accompanying charts, using the example of Millard E. Tydings, United States senator from Maryland, in speaking before the forty-eighth general meeting of the American Iron and Steel Institute, New York, June 25. Two of the charts and Senator Tydings' address are reproduced in STEEL, June 5, p. 15; the other two charts were not then available for reproduction.

Senator Tydings' chart on manufacturing shows that 80 cents of every dollar paid out for wages and salaries. Eighty cents of every dollar of mining income goes for wages and salaries. In construction, wages and salaries also took 80 cents, while in transportation the share was approximately 75 cents.

The chart on business savings shows that from Jan. 1, 1929, through Dec. 31, 1935, all business paid \$23,529,000,000 more than was taken in. Figures in preparing the charts were compiled by the Federal Reserve Board of commerce.





1919 through 1938, will be published shortly by the Conference

ional income was reduced 10 cent, from \$69,400,000,000 in to \$62,500,000,000 in 1938. In agricultural states and the District of Columbia was relatively maintained. At the other extreme was a 23 per cent decline in Michigan, which reflected a virtual drop in automobile and industrial output.

per capita income for the entire country in 1938 amounted to \$480, in 1937 it was \$537. The District of Columbia led last year with a per capita figure of \$1065. Among states, New York ranked high with \$748. Lowest was Mississippi with only \$201.

## Training Course Started for Malleable Founders

Malleable Founders' society is sponsoring an eight-week intensive training course, beginning June 26,

at Rensselaer Polytechnic institute, Troy, N. Y., according to Robert E. Belt, executive secretary, Cleveland. The course is restricted to employees of the society's member foundries. Purpose of the undertaking is product improvement in the malleable industry and training of young men in basic technology of malleable production.

Theory and practice are included, lectures and discussions being reinforced with laboratory and shop work. Dr. M. A. Hunter, head of the department of metallurgy, is supervising the course with Professors Scott Mackay, Augustus Jones and H. M. Sullivan assigned to full-time instruction. Prof. Enrique Touceda, emeritus head of the department and for the past 25 years consulting engineer for the Malleable society, is assisting in the instruction, and J. H. Lansing, shop practice engineer of the society, Cleveland, is handling subjects related to shop operations.

Subjects included in the course are: General metallurgy, chemical analysis, pyrometric practice, spec-

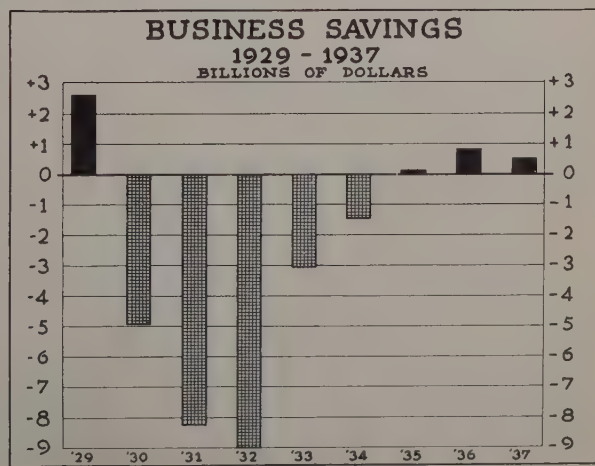
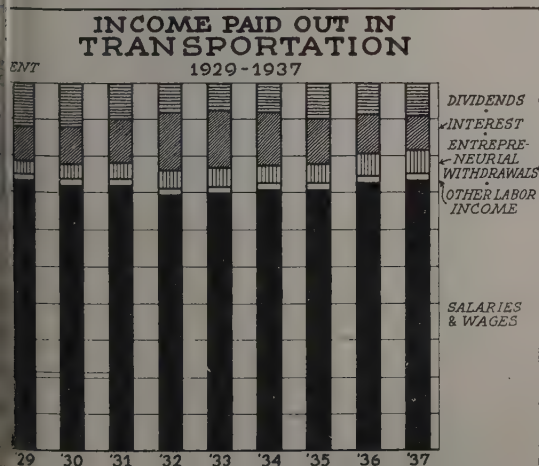
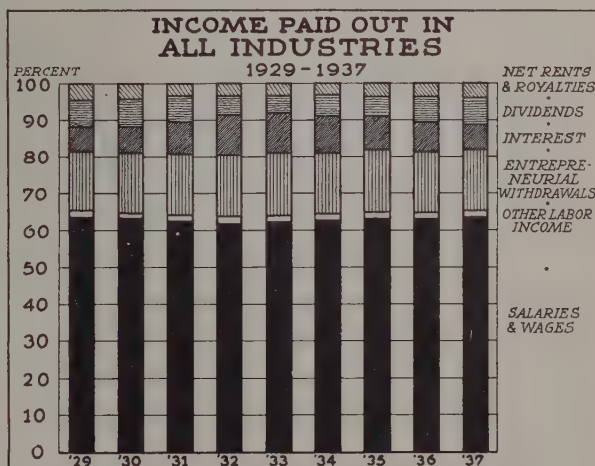
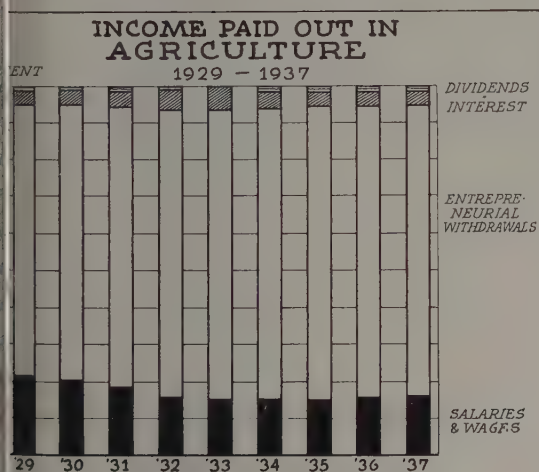
trographic analysis, radiography, sand testing, physical testing, metallurgy and metallography of malleable, and malleable foundry practice. Systematic plant visits in nearby industries are planned.

## Steel Institute Issues 1938 Statistical Report

American Iron and Steel institute's twenty-seventh annual statistical report, for 1938, has been distributed. Format is the same as in recent years and most tables show comparative data for at least four or five years. Changes have been made in some tables for simplicity but not sufficiently to affect comparability with earlier years.

A new feature is a detailed topical index, greatly facilitating search for various statistics. In addition to complete coverage for the United States the report provides statistics for Canada and production figures on iron ore, pig iron and steel for 24 principal countries from 1920.

## Major Tydings in Address to Iron and Steel Institute





## Why Worry About the Machine?

■ A LOT of excitement prevails these days in the discussions as to the status of the machine as it affects employment. The defender of the machine tells an impressive story about the employment provided by the machine. The critic of the machine tells about men thrown out of employment by the machine. The inescapable fact is that both the defender and the critic of the machine are right. The machine provides employment. It also throws men out of employment.

The battle over the machine and its influence on employment is the result of the same condition that is responsible for the organized drive against employment of married women that now rapidly is gaining momentum. This same condition brought the wages-hour act. It partially motivated the creation of the Wagner act. It was responsible for the farm problem. It has had much to do with the railroad problem. It is one of the reasons why the business-persecution complex of our present national administration has been listened to sympathetically by so many of our citizens. The same condition is responsible for our unemployment problem. It is responsible for our relief problem.

### More Employment, Higher Purchasing Power Real Problem, not Machines

The trouble today, as over the past decade at least, is economic. If people in this country today were able to buy the goods that they need or want, there would be none of these problems. There would be no quarrel as to whether the machine provides or curtails employment. There would be no argument as to whether married women should or should not work for wages. As a matter of fact, there would be plenty of work for all. There would not be enough

machines, nor enough men and women to operate them, to produce the goods in the desired volume.

The battle over the machine is just as much beside the point as the effort to provide government insurance of loans to small business. It is just as much beside the point as the belief, now existing in some "liberal" minds, that the government ought to buy corporation securities on the stock exchanges in order to have a direct voice in directing the affairs of these corporations, allegedly in the public interest.

There is only one important fundamental question before the country at this time and that is: "How are we going to provide employment for every man and woman able and willing to work at good wages?"

### Industrial Profit Is Key to Revival; National Policy Needs Revision

STEEL believes that the only real solution to this problem, if we are to continue as a democratic country, is a relatively simple matter. It lies in such a revision of our whole national policy as will attract capital into private industry. That can be done only through encouraging industry to make a profit. The theory is rather widely held in liberal circles that fundamental conditions have changed to the extent that some sort of governmental participation in business hereafter always will be needed to supplement private industry in providing general employment. But there can be no honest judgment on this point unless, and until, every effort has been made to raise private industry to its greatest potentials.

In the meantime, the approach should be made on the main economic problem, rather than on its many and varied aspects, of which the place of the machine in reference to employment is only one.



# The BUSINESS TREND

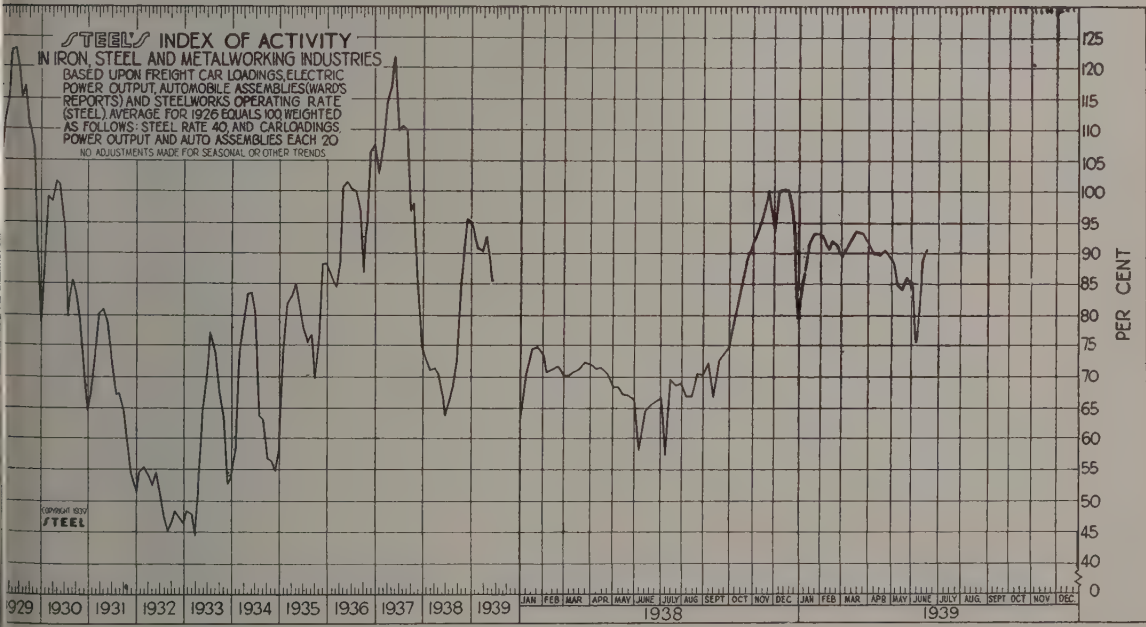
## Sentiment Improves On Holiday Rise

CONTINUED upward swing of most business indices, the seasonal trend is normally the reverse, has added the confidence of many industrial leaders. The index is now at the highest level since the week of April 1 and is 6.7 points above the 1939 low, during the holiday week, of 84.2 recorded in the week of May 13. Since the bottom was touched early in the preceding Memorial day week, the index has regained 40.6 per cent of the ground lost in the preceding months.

Noting encouraging gains in three of the four

barometers composing STEEL's index in the week ended June 17, the index rose 2.7 points to 90.9. This compares favorably with the index figure of 65.2 in the same week last year, but remains well below the 110.3 level in the corresponding week in 1937. Comparisons over the next few months with that of a year ago will not be so favorable, for it will be recalled that at this time last year an upward trend in industrial activity got underway which lasted into December before reaction set in. Some prognosticators believe that a similar upturn in activity, but not so pronounced as a year ago, has already started.

The national steel rate eased 1 point to 52.5 per cent in the week ended June 17, thus bringing to a halt the sharp upturn recorded in the preceding three weeks. A year ago the steel rate stood at 27 per cent. This was the only business indicator composing STEEL's index to decline in the week ended June 17, however, a rebound to



STEEL'S index of activity gained 2.7 points to 90.9 per cent in the week ended June 17:

Index	1939	1938	Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
.....	92.2	72.0	Jan.....	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
.....	90.0	71.3	Feb.....	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
.....	89.7	71.4	March.....	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
.....	90.4	70.8	April.....	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
.....	89.2	68.4	May.....	85.3	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
.....	85.1	68.5	June.....	.....	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
.....	84.2	67.2	July.....	.....	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
.....	86.6	67.1	Aug.....	.....	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
.....	85.4	66.5	Sept.....	.....	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
.....	75.9	58.1	Oct.....	.....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
.....	88.2	64.4	Nov.....	.....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
.....	90.9	65.2	Dec.....	.....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3



THE BUSINESS TREND—Continued

approximately 55 per cent is scheduled for the latest week.

Automobile production during the week ended June 17 registered an unexpected advance to 78,305, to reach the best level since the last week in April. The contra-seasonal advance was traceable to the Briggs strike in May, although moderate increases were noted at plants other than those of Chrysler. Early sales reports for the first ten-days of June, indicate deliveries are about the same as recorded in the comparable period during May.

Improvement in revenue freight carloadings in practically all sections of the country in the week ended June 17, resulted in a normal seasonal advance to 637,873 cars. This compares with 634,597 in the preceding seven days and 555,569 in the like 1938 period. Carloadings are now at the highest level since the week ended Dec. 3 last. Electric power output also recorded an encouraging increase to 2,264,719,000 kilowatt-hours in the week ended June 17, to regain all the ground lost since the second week in February.

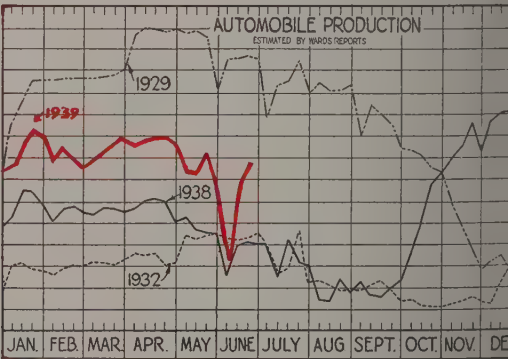
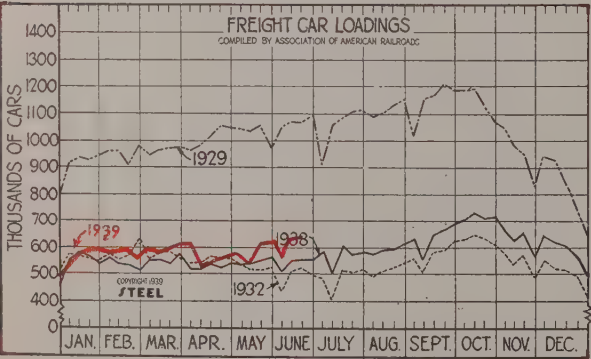
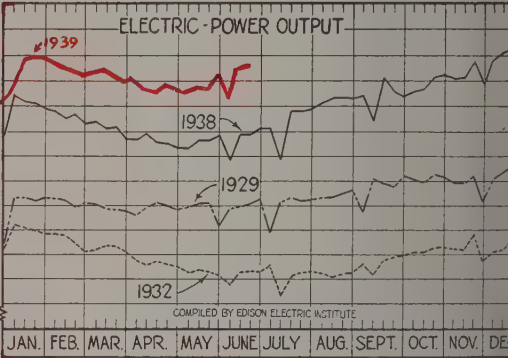
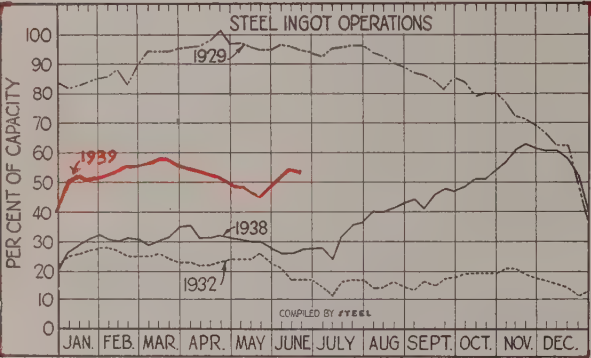
DECLINE IN FAILURES NOTED

Insolvencies during May totaled 1122 and involved \$14,-

757,000 current liabilities. This is a slightly bettering than recorded in April, when failures totaled with liabilities of \$17,492,000. In May last year were 1123 failures and liabilities were placed at 1,000. Wholesale disasters rose to 136 from 109 in April. In the other classifications an increase was in the construction division, while fewer failures reported in the manufacturing, retail firms and commercial service groups.

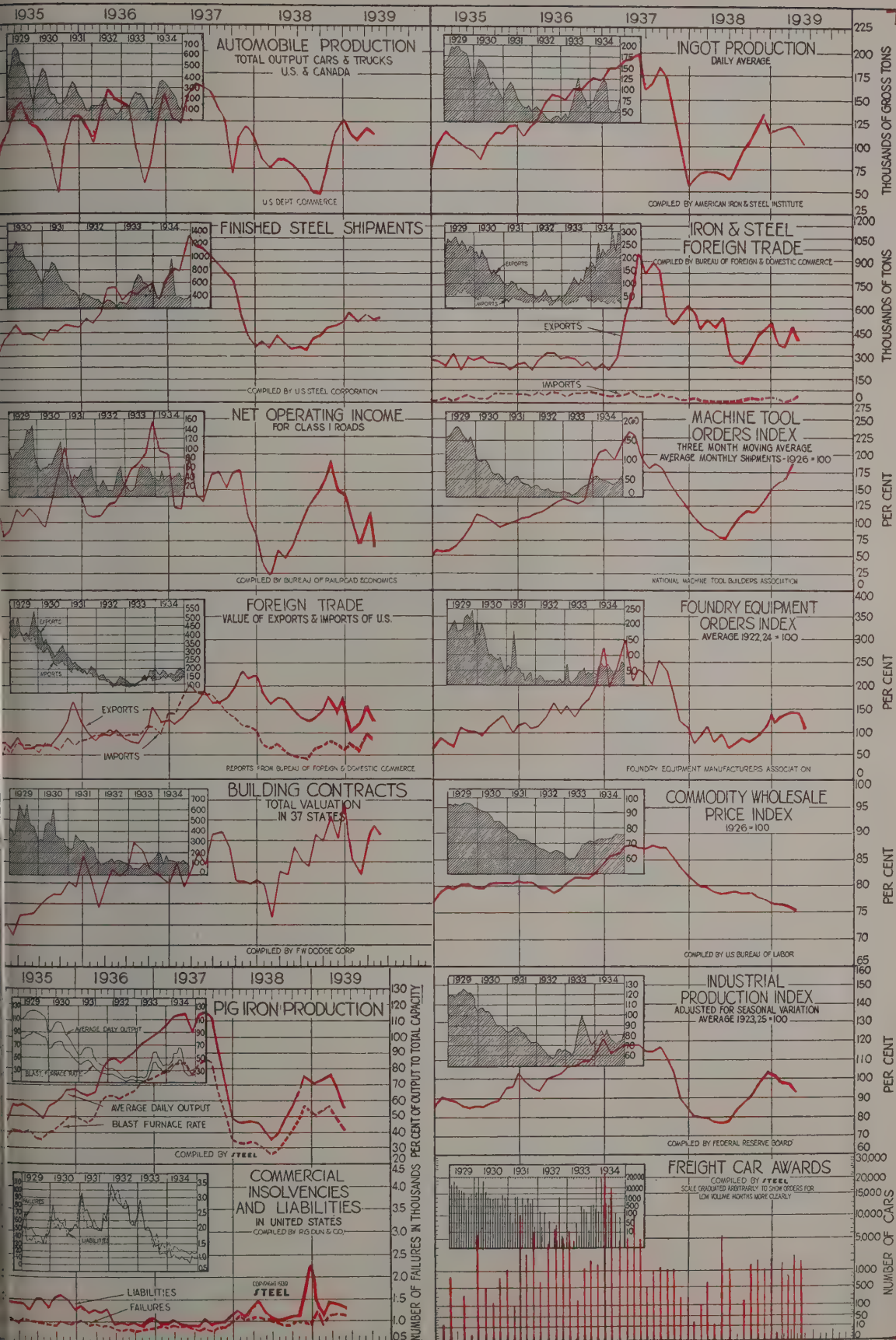
FOUNDRY EQUIPMENT ORDERS DECLINE

The foundry equipment monthly order index, after a sharp decline during May, according to the Equipment Manufacturers' association. The May orders was placed at 108.8, compared with April and 90.6 in May, 1938. The association's shipments advanced last month to 144.3, up 13 from the April level and exceeded the May, 1938 figure of 91.3. Reflecting the decline in orders, increased shipments during May, the index figure of volume of unfilled orders last month declined from 208.6 recorded in April. In May last year unfilled orders index stood at 157.5.



Week ending	Steelworks Operating Rate Per Cent				Electric Power Output Million KWH			Freight Car Loadings Thousands of Cars					Weekly Auto Output		
	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932
Feb. 25.....	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,155
Mar. 4.....	56.0	29.5	25.0	89.5	2,244	2,036	1,519	1,707	599	553	560	977	73,705	54,440	31,390
Mar. 11.....	56.5	30.0	25.5	94.5	2,238	2,015	1,538	1,703	592	557	575	946	84,095	57,438	31,110
Mar. 18.....	56.5	32.0	24.5	94.5	2,225	2,018	1,537	1,687	594	540	585	958	86,725	57,558	30,590
Mar. 25.....	55.5	35.0	23.0	94.5	2,199	1,975	1,514	1,683	605	573	561	961	89,400	56,800	32,890
Apr. 1.....	54.5	36.0	23.0	95.0	1,210	1,979	1,480	1,680	604	523	545	967	85,980	57,500	35,750
Apr. 8.....	53.5	32.0	22.0	95.5	2,173	1,990	1,465	1,663	535	522	545	956	87,019	60,975	35,390
Apr. 15.....	51.5	32.0	22.0	96.0	2,171	1,958	1,480	1,697	548	538	567	972	88,050	62,021	35,770
Apr. 22.....	50.5	32.5	23.0	98.0	2,199	1,951	1,469	1,709	559	524	562	1,004	90,280	60,563	30,670
Apr. 29.....	49.0	32.0	24.0	101.0	2,183	1,939	1,445	1,700	586	543	554	1,052	86,640	50,755	31,120
May 6.....	49.0	31.0	24.0	97.0	2,164	1,939	1,429	1,688	573	536	534	1,050	71,420	53,385	43,890
May 13.....	47.0	30.0	24.0	97.0	2,171	1,968	1,436	1,698	555	542	517	1,048	72,375	47,415	42,580
May 20.....	45.5	30.0	25.5	96.0	2,170	1,968	1,435	1,704	616	546	516	1,046	80,145	46,810	43,470
May 27.....	48.0	28.5	23.0	95.0	2,205	1,973	1,425	1,705	628	562	521	1,061	67,740	45,120	45,120
June 3.....	52.0	25.5	21.0	95.0	2,114	1,879	1,381	1,615	568	503	447	972	32,445	26,980	44,110
June 10.....	53.5	25.5	17.0	96.5	2,257	1,992	1,435	1,690	635	554	502	1,055	65,265	40,175	43,490
June 17.....	52.5	27.0	17.0	96.0	2,265	1,991	1,441	1,699	638	556	518	1,069	78,305	41,790	44,120







# Forum on



# RE-EMPLOYMENT

■ ONE OF the most important of the major industries on which recovery generally is conceded to hinge is the construction industry. It is a well known fact that a tremendous backlog of potential building business has accumulated over the past ten years—not only through growth of our population but also through depreciation and obsolescence of existing residential, business and industrial buildings. There has been widespread conjecture as to what all this might mean in terms of dollars and employment.

In this week's Forum a man very close to the construction industry gives some facts which are made doubly significant by his well-justified optimism regarding the outlook in this business. The author is Ernest T. Trigg, president, National Paint, Varnish and Lacquer Association Inc., with headquarters in Washington. Mr. Trigg has for many years been an active figure in commercial and civic affairs in Philadelphia, where he still maintains a home. He is chairman of the board of the Federal Home Loan bank for the third district; of the Industries Affairs committee; Producers' Council Inc., which is affiliated with the American Institute of Architects; and of the National Housing Advisory council.

—The Editors

■ In discussing the relation of construction activities to recovery I will later on in this article develop three points which will help toward understanding the existing situation in this important industry. This situation is, not—in the judgment of the construction industry itself—a discouraging one. Leaders in this industry, as was revealed in the Construction Industry conference held not long ago under the auspices of the United States chamber of commerce, are as a matter of fact rather optimistic about the outlook. This applies not only in residential building but also in heavy engineering, industrial and other forms of non-residential construction work, including rehabilitation

and modernization of commercial structures.

While it is not expected that any boom is around the corner, it is reasonable to believe that recovery in private construction work, now definitely under way again after the 1937 recession, will continue. In the next five years this recovery should reach a volume comparable to that of the healthy post-war recovery years of 1922-24.

If this optimism has a reasonable basis, it is of interest not only to the construction industry but also to all branches of American business because construction work must go forward in increasing volume if the capital goods industries are to recover fully. Every one is eagerly

waiting for recovery of the goods industries because the recovery alone can bring about factory re-employment of millions now unemployed or on work.

In answering your natural question, "What is the basis for optimism?", I will draw upon certain papers and discussions from the most recent Construction Industry conference which was the final meeting of all divisions of the construction industry since 1937. And in that connection, I will develop briefly the three points referred to at the beginning of this article. The first point I want to emphasize is the importance to the industry and workers of private construction other than residential building, which is frequently overlooked, especially at a time when there is so much public discussion of residential building.

## Non-Residential Building

During the active period of 1931 there were employed—directly and indirectly—between 3,000 and 3,500,000 men yearly in building private structures and in maintenance for various forms of residential construction. In these years some \$5,000,000,000 annually of new financing, excluding all government, foreign and war issues and those of investment trusts, flowed into this non-residential construction and equipment market. This compares with expenditure for residential building of some \$3,800,000,000 during the same active years which produced yearly direct and indirect employment for some 2,000,000 men.

Based on department of commerce figures of total private non-



n expenditures, it may be  
ed conservatively that in the  
37 there were employed ap-  
ately 1,000,000 men in pri-  
on-residential construction  
ut 800,000 in private residen-  
ding. Since public improve-  
xpenditures have been kept  
emergency financing and as  
nancing cannot be increased  
ably without undue burdens  
payers, it obviously follows  
covery of the construction  
y to reasonable employment  
inges on revival of private  
investment.

ite of severe handicaps, the  
capital market is showing  
ative powers. New financ-  
cluding all government, for-  
d refunding issues and those  
vestment trusts—reached its  
sion low in the years 1933  
34 with a volume for each  
e years of \$159,000,000. This  
e climbed to \$1,179,000,000 in  
nd continued in 1937 with a  
e of \$1,158,000,000. For the  
ne months of 1938 it was \$670,-

e this is nothing to crow  
it is not the hopeless picture  
faced us a few years ago.  
is increasing public recog-  
of the importance to employ-  
and recovery of stimulation of  
private investment funds in  
ustrial building and equipment,  
ercial building, public utility  
uction and similar enterprises  
in turn stimulate capital  
production.

are compelled to believe that  
recognition of this fact, to-  
with increasing pressure for  
nization, re-equipment and  
struction which obsolescence  
sting structures constantly is  
g, will, cause a further reg-  
of the private capital mar-  
That will in turn further re-  
of the construction and capi-  
ods industries, which as in-  
d before, go hand in hand.

#### Merchandising Methods Improved

second point to which I call  
attention is the improvement  
acter of the construction in-  
s' merchandising methods.  
raditional attitude of this in-  
was to "sit and wait for the  
ss." That mental attitude,  
ooted as it is, is going through  
ound and significant change.  
example, during the industry's  
ence positive emphasis was  
on opportunities for develop-  
w business through "modern-  
ain street" and rehabilitating  
rebuilding blighted areas;  
h new methods of financing  
ements for standardized and  
plant construction; and  
h more aggressive merchan-



Ernest T. Trigg  
President

National Paint, Varnish and Lacquer  
Association Inc., Washington, D. C.

dising of completed private homes.

Then again, when the industry  
not long ago was faced with charges  
that construction costs were abnor-  
mally high, it undertook in vigor-  
ous fashion to present its case to  
the public. In that connection the  
Producers' council inaugurated a  
"More House for Your Money" cam-  
paign, designed to present a true  
picture of the value existing in to-  
day's home. This was successful  
beyond all expectations. 197 news-  
papers carrying the seven full-page  
advertisements and editorial mate-  
rial to over 30,000,000 readers.

#### Advertising To Continue

Plans to extend and broaden this  
activity are being developed. This  
campaign is based upon the fact that  
there never was so much construc-  
tion value per dollar as there is to-  
day, due primarily to improved  
methods of financing, lower interest  
rates, better design and improved  
materials and methods of construc-  
tion, which give greater utility and  
comfort.

Nowhere is the new attitude of  
the construction industry towards  
sales efforts more marked than in  
its home building division. Build-  
ing material and equipment manu-  
facturers now stress in their adver-  
tising and promotional efforts, the  
completed home rather than ma-  
terials and equipment which go in-  
to it. This important change in  
method is due to a desire on the  
part of manufacturers to present a  
complete service or "package" to  
the public. In this connection, I call  
your attention to what I regard as  
the most significant of the new  
developments in the selling of  
homes. It is the so-called "unit  
sales plan," which was explained  
at the industry's conference by Mr.  
Cheyney, a building materials deal-  
er of Bluefield, W. Va., in the fol-

lowing words: "Under this plan each  
factor in the building industry per-  
forms his usual service, but it is  
all done through a single channel.  
The architect designs the house, the  
dealer advertises and sells it, the  
contractor builds it, and the banker  
finances it, but all of these functions  
are cleared through the office of one  
so that it is possible for the home  
owner to transact business at one  
place and with one person."

My third and final point relates  
to the interest which individual  
chambers of commerce are now tak-  
ing in problems of the construction  
industry in their own communities.  
Since this industry by nature is a  
highly localized one, this is a sig-  
nificant and most encouraging de-  
velopment.

The construction industry is not  
a compact one. It is composed of  
many branches—professional men,  
engineers and architects; general  
and subcontractors, and residential  
or operative builders; building ma-  
terial dealers and manufacturers,  
and financial agencies. There fre-  
quently is lacking definite realization  
on the part of these various groups  
that they are component parts of a  
single comprehensive industry—the  
construction industry—with certain  
problems common to all elements  
in it.

By co-operation with these several  
groups, local chamber of commerce  
can assist in building up integration  
indispensable to more efficient pro-  
motion of construction activities. As  
the construction industry recovers,  
it in turn should take a more promi-  
nent part in chamber of commerce  
work.

Local chambers of commerce are  
providing a useful service to the con-  
struction industry by the active in-  
terest they are taking in moderniz-  
ing building codes, by making more  
effective and practical local zoning  
ordinances and city planning activi-  
ties, by assisting the industry with  
apprenticeship training programs,  
and by aiding it in obtaining local  
information on the supply and de-  
mand for various types of struc-  
tures.

#### New Recovery Cycle Seen

In presenting this outline of some  
reasons for present optimism in the  
construction industry, I am fully  
aware that many business observers  
feel that the present upturn cannot  
outlast the government's spending  
program. The construction indus-  
try, however, believes that it can,  
and believes that we make a mis-  
take in underestimating our coun-  
try's recuperative power. In that  
connection Thomas S. Holden, vice  
president, Dodge Corp., had this to  
say at the conference: "The con-

(Please turn to Page 58)

# New Materials

## For Electric Equipment

Glass fabric, cellophane, other cellulose insulating materials now compete with cotton, linen and mica. Similarly, other new materials are encroaching on the old standbys to make possible lighter, more compact machines with higher capacities and efficiencies

By L. E. MILLER

Electrical Engineer  
Reliance Electric & Engineering  
Co., Cleveland

■ IN THE field of motors, generators and other electrical equipment, the competition of new materials is becoming more and more in evidence. The trend is not so much toward making a cheaper machine as it is toward making a better one and opening up new applications heretofore not economically possible. Of course, production economies frequently accompany the effective use of new materials.

Until recently insulating mate-

Main field coils for a direct current motor. Wound with cellophane-covered enameled wire and impregnated with polymerizing baking varnish, coils are covered with a layer of glass tape, a layer of varnished cambric and a final layer of glass tape

rials, for instance, have consisted principally of cotton, linen, silk and horn fiber with some asbestos and mica. These are impregnated with various types of insulating varnishes or binders. Also, much enameled wire was used, mainly on small motors and in the field coils of larger machines.

But the picture has begun to change. Glass yarns and fabrics, cellophane and other cellulose materials are finding an increasing range of applications. Canvas, impregnated with bakelite, is being

used for slot sticks. Terminal brush studs and switch motors are being made of various synthetic materials, and porcelain enamel an insulating coating for parts of motors has been tried with some success.

Research has produced a series of new insulating materials. New alloys have facilitated the casting of rotors. These, however, are in many instances now pressure cast. There is a trend toward fabricating frames and other motor parts that previously were cast. On small motors, castings are being used for brush holders. The technique of heavy resistance welding has been developed at the point where thicker and larger sections now can be spot welded satisfactorily. Smaller commutator bars have been made possible by the use of copper alloys, and nickel is bringing greater strength to rotor and commutator spiders.

### New Steel Reducing Cores

A new, low loss, silicon steel lamination is coming into more universal use. Its use may effect other reductions in both manufacturing and operating costs of many types of electrical equipment.

Electrical insulation is classified into three classes—A, B, and C. Class A includes linen, cotton, paper, and similar organic materials. Class B insulation consists of inorganic materials, such as glass, asbestos and mica, bonded together with organic materials, varnishes for instance. Class C insulation is completely inorganic. It covers glass, mica, porcelain, and similar materials. Glass insu-





ers great possibilities in cost of lower cost and more efficient equipment which must meet requirements.

Insulation already is available in the form of tapes, braided and woven cloth combinations and mica. Continuous filament is made in thicknesses as thin as 0.003-inch, staple fiber tape is 0.010-inch. Continuous filament glass tape, 0.5- x 0.005-inch in average tensile strength, stands up at room temperature and retains a strength of 133 per cent after 30 minutes exposure to a temperature of 700 degrees Fahrenheit, which is, of course, far above what is to be encountered in practice. Some rectangular wire sizes of round wire are being covered successfully with glass insulation.

### Insulation Improves Motors

Insulation possessing high mechanical strength and being nonhygroscopic, noninflammable, and having insulation resistance which is not subject to deterioration with time is less expensive than some other materials. It offers resistance to attack by moisture, corrosive fumes and acids, and most applications has been found to be more economical of space. Since glass insulation is capable of being applied to wire in thickness from the equivalent of single silk to asbestos or the designing engineer may save the space factor by selecting glass covered wire with insulation as thin as mechanical stress demands warrant. For slot cell work, glass cloth has been impregnated with varnish to afford a protective material.

Cellophane and other cellulose insulating materials which are available may possess new advantages in many applications. Cellophane is an extremely stable material, so it does not deteriorate or age. Cellulose acetate, a similar material, is also so stable. However, it has a very high dielectric strength and resistance to moisture.

Desirable characteristics of these materials are combined in tape consisting of a layer of cellulose acetate between two layers of cellophane. Cellulose acetate is thermally stable but has two or three times the dielectric strength of cellophane. The three-layer combination affords a length with high insulation resistance as well.

Such as a 15 per cent gain

in insulation of stator coil here receives insulation. Heads of coil are covered with glass tape. Other coils are covered entirely with glass tape and mica, such as the one on top here

in space can be achieved where cellophane replaces other materials as a covering for enameled wire in small sizes. This is naturally important on many electrical windings. On such applications, a strip of cellophane about 1/8-inch wide and 0.001-inch thick is wound on the wire with a one-third lap. It is cemented and lacquered over after being wound. Only one layer of the tape is necessary for protecting the wire, but it is lapped to assure all surfaces being covered.

Combinations of cellophane and mica give excellent characteristics. In a test of various materials held at 350 degrees Fahrenheit for four hours, cellophane-backed mica showed no ill effects whatever.

Usual construction of such composite tapes is to enclose a mica strip, from 0.006 to 0.009-inch thick, between two cellophane strips, each 0.001-inch thick. Total thickness may range from 0.007 to 0.011-inch (7 to 11 mils) as one of the cellophane strips can be omitted if desired. Compared with cloth-backed mica, such tape shows a 28 per cent increase in insulating efficiency according to space occupied. Total thickness of the tape required for a job can be reduced 0.001 to 0.003-inch (1 to 3 mils).

Conventional baking varnishes for electric motors use black gums, resins, china wood oil or linseed oil with petroleum naphtha and depend largely upon oxidation for drying which may take considerable time. Also on a deep coil, say 3 x 3 inches, it is hard to get oxygen in to dry the varnish, even with long baking periods.

New synthetic resins help solve

this problem as these materials dry mainly by polymerization and condensation—chemical reactions which can be speeded up by application of heat so that in certain instances they react with extreme rapidity. Oil from the shells of cashew nuts has been found to act like natural phenolic resin. It polymerizes readily after proper treatment. Original phenolic resins were too hard and had to be plasticized.

Air-drying varnishes and finishes have been improved by substituting new synthetic resins. They can be thinned easily. Glyptal resins also are employed in some of the new finishes.

### Magnesium Alloy In Rotors

Material for cast rotor windings previously was confined largely to die cast aluminum. Now alloys of magnesium afford a wide latitude in motor characteristics available with one rotor slot size and design. This of course greatly enlarges the field for motors of this construction.

Another development is the pressure casting of larger and larger rotors. Formerly limited to comparatively small motors, it is now used in making motors up to 100 horsepower at 1150 revolutions per minute and shortly will be extended to sizes up to 200 horsepower. This expansion is due largely to a new method which makes it possible to cast the rotor bars through the spaces necessary to ventilate the core.

Die casting also has been applied successfully to other parts of motors, quite a number of die cast brush holders being in use. However, it is necessary that the parts





be made in large quantities, 5000 to 10,000 lots being essential if the full economies of the process are to be realized.

Use of welding, while greatly enlarged, finds its full possibilities cramped by the desire to imitate or the unconscious imitation of castings. It probably will be some time before designers and engineers succeed in breaking away completely from conceptions of structures as castings and take full advantage of designs expressly suited to construction by welding. A recent series of developments in connection with heavy resistance welding, however, may be significant. They afford effective spot welded joints in much thicker and heavier sections than heretofore possible. Known as interrupted resistance welding, the current is applied in a succession of short shots.

### Alloy Steels Find Uses

Alloys of various types find increasing application. A number of alloy steel shafts are already in use and many machines have been equipped with stainless steel shafts for particularly severe service. Likewise motor enclosures of stainless steel possess advantages which

Canvas, impregnated with bakelite, machines accurately to make excellent slot sticks to hold coils in place. Note fixture with rollers to permit turning the stator while it is being wound

make them particularly suitable for much electrical equipment.

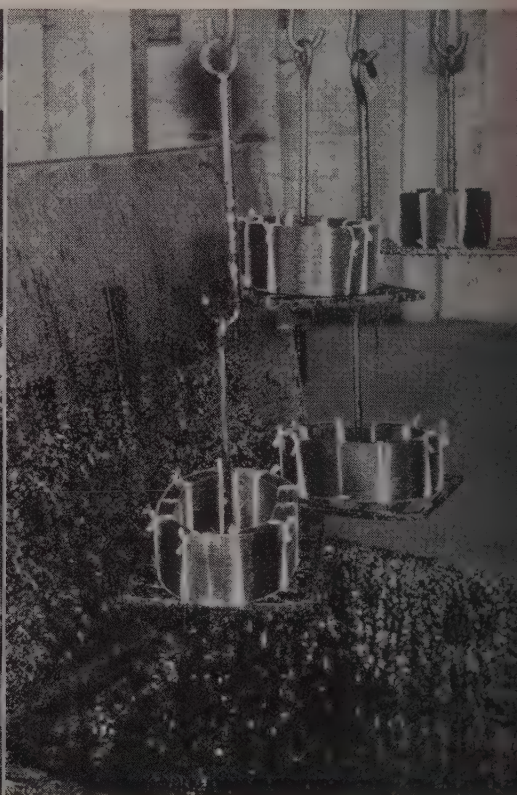
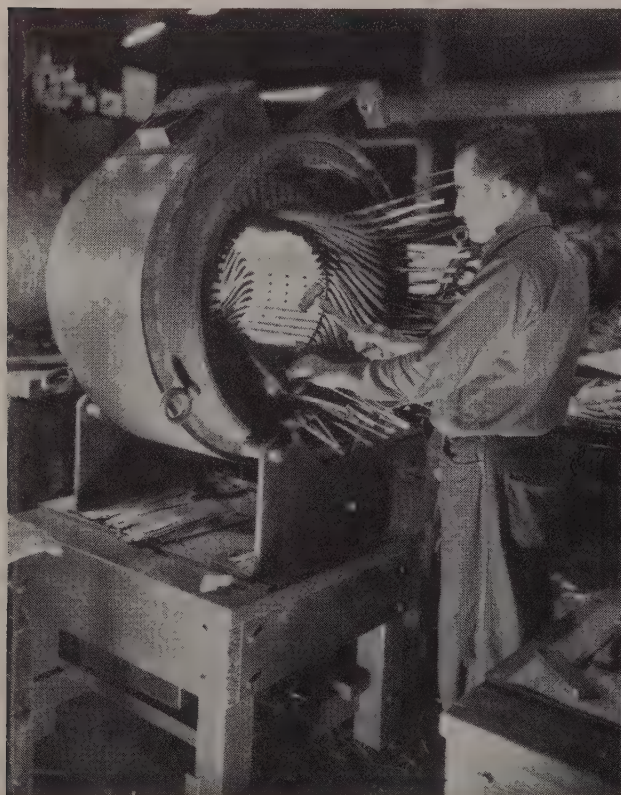
The story of low-loss steel sheet for core laminations is an interesting one. Developments are continually bringing about newer materials with lower losses. As measured by the Epstein test, wattage power loss per pound of material now varies throughout a wide range. Armature steel is perhaps the lowest grade. Next comes electrical steel, followed by motor special and dynamo special. Now comes a higher-silicon steel called transformer special, which shows a new low value in watts loss per pound and when incorporated into electrical equipment reduces the total cost because the machine can be built smaller and will operate with a higher efficiency.

The significance of these developments is to be measured in their already marked effect on electrical equipment design. In the increasingly wider application of inorganic insulations, in the substitution of fabricated sheet steel parts for castings wherever possible, and in the more recent widespread adoption of ultra low loss lamination materials, today's electrical machinery manufacturer finds himself in possession of new tools by which to achieve ever higher standards of excellence in the design, construction and performance of motors, generators and related electrical equipment.

## Welding Arcs Interrupted Without Noise or M

■ The noise associated with that terminate spot welds is eliminated by a device developed by Westinghouse Electric & Manufacturing Co., East Pittsburgh. The spot weld currents are interrupted without noise, without moving contacts, two small metal cans or tubes operate on the principle of a nitron; in this instance, they serve no timing function, only of a switch or contactor. They accomplish their task of interruption simply by stopping the flow at end of each half cycle, not permitting it to start again unless tube gets its signal from an ignitor. Two tubes are used for positive and one for negative waves. They can be considered as a full-wave rectifier, except they are connected to give an alternating output instead of a directional flow of current. The tubes, their water connections and terminals are all contained in a small cabinet only slightly larger than a safety-switch cabinet.

Thick coils of cellophane enameled wire like those here are impregnated with a polymerizing resin which dries quickly by the application of heat. This produces a solid high mechanical strength and excellent insulation characteristic.







# DID YOU EVER ride 600 miles on a camel?

A camel trip from Bagdad to Beirut  
— 600 miles — was a hot, jolting  
ride in the old days. Now you can  
make the trip in magic carpet style,  
in an air-conditioned bus equipped  
with smooth riding Chromium-  
Vanadium Steel Springs.



*Conditioned Trans-Arabian Sleeper bus of the Nairn Transport Company, Ltd., equipped with Chromium-Vanadium Steel Springs.*

**ANADIUM CORPORATION  
OF AMERICA**

# VANADIUM

420 LEXINGTON AVE.  
NEW YORK, N. Y.



## Light-Weight Box Cars

Combining modified open-hearth steel Z-bars in sill and high-tensile low-alloy steel in other parts of underframe saves 2082 pounds in the construction of welded underframes for light-weight box cars

### Part I

■ SINCE FREIGHT charges, and railroad income, are based on pay load handled, decrease in dead-weight, which is nonincome producing, results in corresponding reductions in operating costs. Modern freight cars of welded, low-alloy, high-tensile steel as made by Pullman-Standard Car Mfg. Co., Michigan City, Ind., offer such cost reduction opportunities to the railroads.

In 1918, standard 100,000-pound

capacity freight cars weighed 47,700 pounds. Welded construction, using new type steels cuts this weight to 35,600 pounds, a net reduction of 12,100 pounds or 6.05 tons. Other design improvements permit further reduction in weight so net gain compared with recent unwelded mild-steel bodies and steel underframes of heavier section is about 4½ tons.

Conservative estimates of yearly savings of this modern light-weight welded standard box car compared to a standard car built 10 years ago

indicate a saving of \$180.35 per car. This consists of \$87.00 due to lighter weight; \$87.00 savings due to increased tonnage capacity, \$13.98; savings in maintenance cost \$69.45; and miscellaneous repair cost savings of \$13.98.

Since approximately 40 per cent of freight cars owned by railroads are over 20 years old, replacement is one of the problems facing the transportation industry. The new light-weight cars, which offer possibilities of \$3600 savings in operating costs in 20 years, plus longer life due to the greater corrosion resistance of the newer steels, may be one of the best methods of meeting high railroad operating costs.

### Increases Lading Ratio

Standard dimensions for the Pullman-Standard light weight box car, Fig. 2, are: Inside width, 40 inches; inside length, 40 feet; inside height, 10 feet. Its normal rated load capacity is 100,000 pounds although it can be loaded to 133,400 pounds, compared to 124,500 pounds maximum for the conventional car of the same rated capacity. New light weight car thus permits an increased lading ratio to rail load capacity of 73.7 per cent to 78.9 per cent.

Increased strength of the new types of high-tensile, low-alloy steel compensates for the lighter weight of material used. To this is added the advantages of weight reduction through welding and improved design.

The article "Welding for

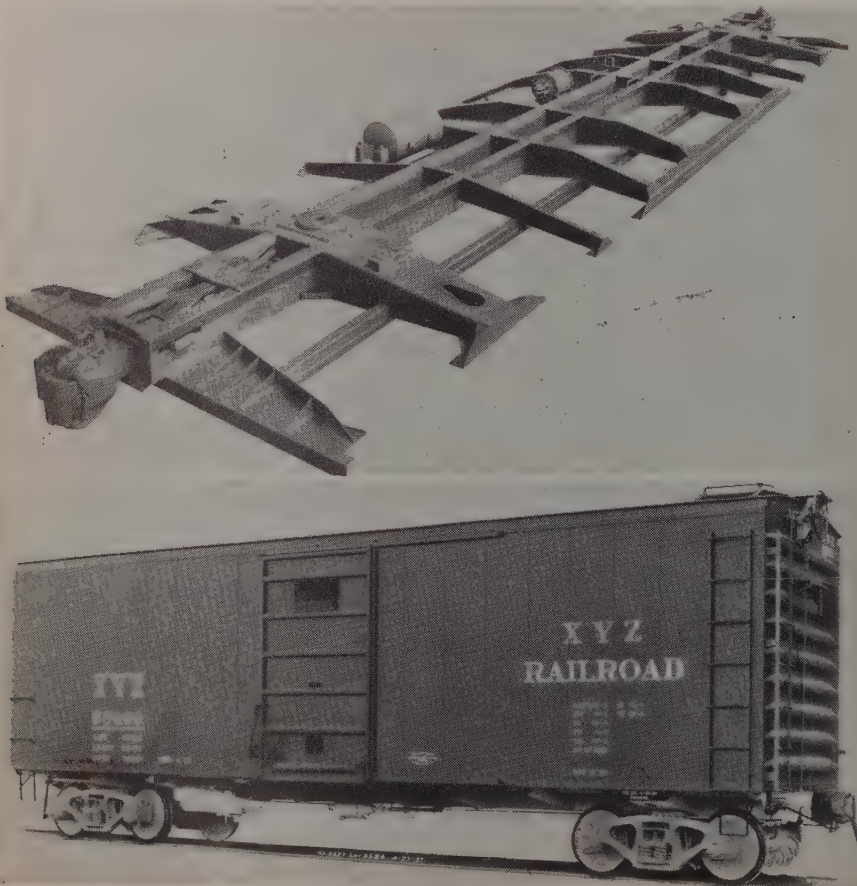


Fig. 1. (Upper)—Bottom view of underframe, the backbone of the car, is formed by welding together special Z-bars of modified open-hearth steel. Cross bearers are high-tensile low-alloy steel. Fig. 2. (Lower)—Completed box car of high tensile low-alloy steel weighs 4½ tons less than unwelded construction using mild steel



on." (STEEL, p. 51, Aug. 22; Aug. 29, 1938), described equipment and fabricating methods in light-weight passenger and freight cars using similar high-low-alloy steels at the Pullman Works, Chicago. Production of these is in larger quantities, is nearly a standard design and an entirely different problem. This article takes up construction of the welded underframe. This article deals with fabrication of ends, doors and top by spot welding and assembly into the complete car.

The underframe, Fig. 1, is most important part of the car as it not only carries weight of load but also resists compression and tension in operation, so it must have rigidity and strength to withstand normal overloads as well as abnormal shocks.

### Special Z-Bars Used

The welded underframes of passenger design and constructed of special rolled Z-bars welded into a channel, with formed and welded end and shape sections for ends and cross bearers, replace the heavier steel construction. These are of modified open hearth shape with minimum tensile yield of 36,000 pounds per square inch due to difficulties in rolling steels in the thin flange section of this shape. These Z-bars replace the similar but heavier open-hearth section with minimum yield of 30,000 pounds per square inch. Greater strength permits a reduction from 36.2-pound Z-bar with 12 square inches of section to a 24-pound bar with 18.4 square

inches of section. The underframe, Fig. 1, consists of a center sill extending full length of car with draft gear (bumpers, springs, etc.) at ends. Bolsters and body bolsters and cross bearers are attached to this to support floor and

the body sill is made of two special Z-bars, 41 feet long, welded into a channel and reinforced by cross bearers with welded plates. Z-bars are 31.3 pounds per foot with a flange 1/16-inch thick and end top flanges 11/32-inch thick. This is made in top flanges. The first step in preparing the Z-bars is to tack weld on the draft lugs, Fig. 3,

which hold the draft gear against tension and compression shocks.

As these lugs are inside the welded center sill channel, they are welded on before welding the Z-bars together. Draft lugs, Fig. 3, consist of two rectangular bars and triangular gussets sheared from plate. To permit all down welding, these lugs are tack welded in position on a special platform of stepped tiering of six Z-bars, three complete sets. The welders start at the top Z-bar and work down, one or more welders working at each end.

### Parts Tipped For Down-Welding

When lugs are positioned by tack welding, jigs are removed and the six Z-bars transferred by manipulator crane to another shop structure. Here Z-bars are tipped to an angle of 30 degrees from horizontal for easy down welding when filling in joints. One or more operators work at the low end and a similar crew are on a platform at the high end. When operators have finished filling-in down welds at their ends, the structure is tipped with the former low end up to permit down

welding on the other side of the lugs. Operators at each end do identical fill-in welding.

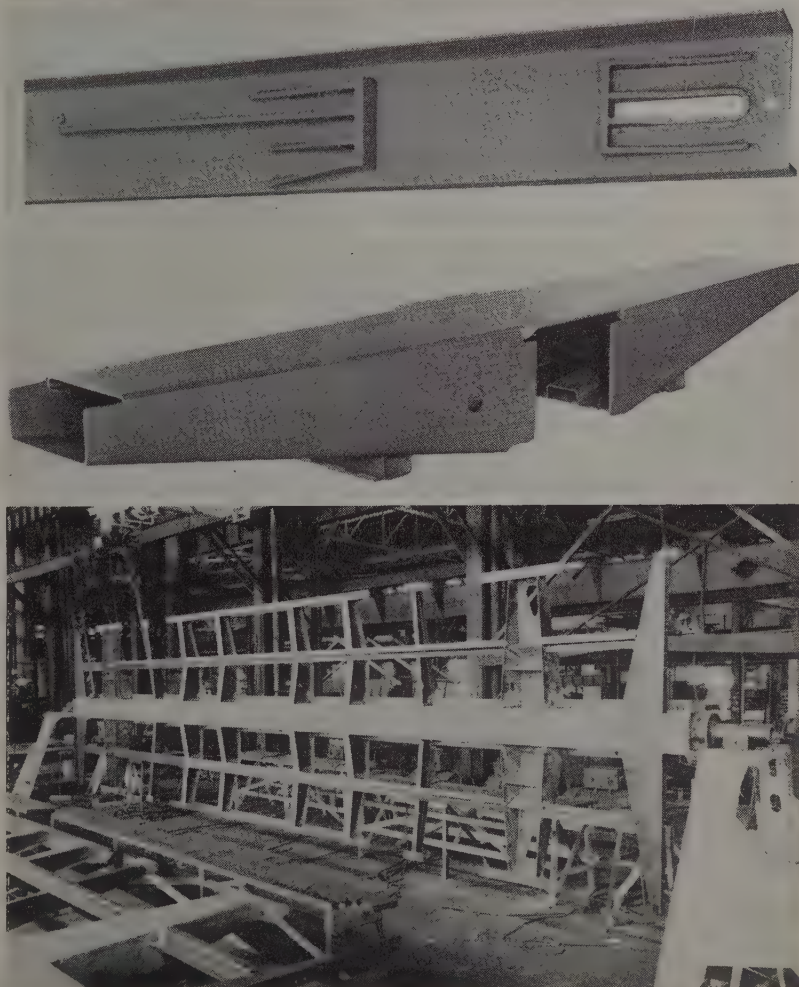
Next step is to weld the two Z-bars together to form the center sill. On freight cars these are arc welded together by hand. Separators and small attachments to fit bolster, etc., also are welded on.

Sill then goes by crane to underframe assembly jig where bolsters, cross bearers, cross ties and end sills are tack welded in position. These units have been welded up in subassemblies from cut and formed low-alloy high-tensile steel (part of the bolster is high-carbon open-hearth steel).

Cross bearers and cross ties are of builtup I-beams arc welded from sheared plates. Every effort is made to prevent waste in cutting, even to performing extra welding as in some of the knee-shaped cross bearers shown at bottom of completed underframe, Fig. 2.

Body bolsters, the largest projecting arms on the underframe, Fig. 4, are made up of two tapered channel or U-sections formed on a press so

(Please turn to Page 63)



(Top)—These lugs are added to ends of Z-bars at both ends before welding into channel for center sill.  
(Center)—Body bolster is arc welded from stampings in a subassembly and then fastened to sill.  
(Bottom)—After tack welding in underframe is mounted on platform in this "turnover" jig to permit welding in for downhand welding in fill-in work



# Plating Conveyor

**New type of conveyor for automatic plating, pickling, burnishing, bonderizing and similar processing work features extreme simplicity, low head room and wide range of applications. It operates hydraulically, by cranks and connecting rods or by chain and sprocket drives**

■ ONE OF the best illustrations of combined handling or conveying equipment and processing equipment possibly is in automatic plating systems. In automatic plating work, especially when plating chromium or silver, a large number of baths are involved. Material must be immersed successively in from 12 to 15 and sometimes a greater number of solutions necessary for cleaning and plating; many rinses also are essential.

Since it may be desirable not only to immerse the material in succession in these different baths, but also to agitate it to speed up action of the solution and to assure uniform surface reaction on the material, means also must be provided to do this.

In addition there may be a third requirement that the equipment be

capable of handling an extremely wide variety of objects. Work handled may include such small articles as bolts and nuts on one hand or large sections of sheet steel on the other.

## Handles Wide Variety of Work

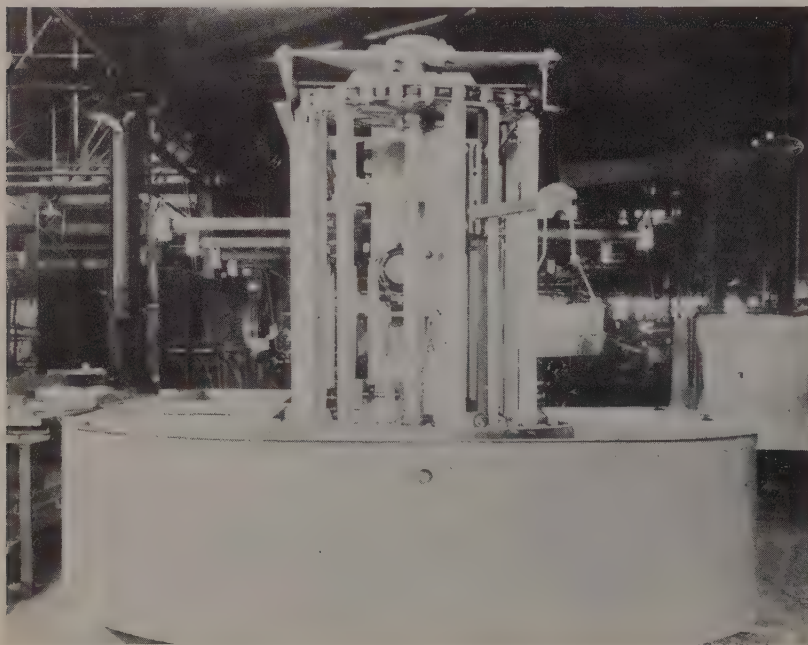
A new type of full automatic plating conveyor developed by Hanson-Van Winkle-Munning Co., Matawan, N. J., is the latest approach to the solution of this materials handling problem. Shown in accompanying illustrations, this machine is called an elevator-type conveyor. It is suitable for almost any of the wide variety of plating and coloring operations which may be encountered. These include basket cleaning, bright dipping, acid pickling, liquid caustic dips, combination cleaning and burnishing in perforated cylin-

ders, barrel plating and lifting dipping, lacquer dipping, bonderizing and all classes of electroplating. Thus it has extremely wide range of application in the metal-finishing industries.

This conveyor is of the dumbwaiter type. In operation a series of tanks containing the necessary solutions are arranged to form a loop or circuit about the conveyor unit. The arrangement is shown quite clearly in accompanying illustrations. The tanks extend out from the conveying mechanism on which are hung fixed racks for the parts if they are small or baskets or barrels if small objects are to be handled. These carriers are mounted on rollers and are guided in vertical guide rails, clearly shown in Fig. 2.

Two conveyor chains carrying the carriers are located at the top of each guide and another at the bottom. Guides are mounted at uniform intervals along the chain. Drive sprockets then permits moving the carriers and their guides from one tank to another as the conveyor moves forward, thus making possible the transfer of material from one solution to the next.

Next it is necessary to provide a means for moving the carriers vertically so they will lift them clear of the tank while they are being transferred from one tank to the next. To do this, a structure extending over the tanks and around the series of tanks on each side the vertical guides includes an angle iron strip around which is engaged the carriers. This structure lifts each pair of guides so vertical

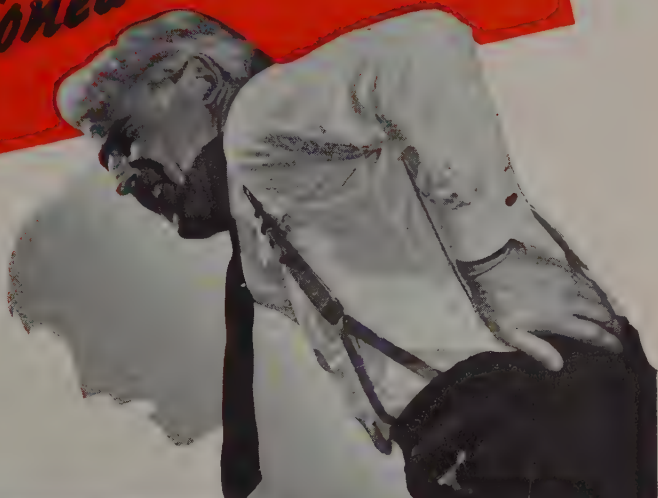


**Fig. 1—End view of new conveyor arrangement used on bright dipping. Material here is being transferred and to be lowered into one of the tanks**



# Corrosion in Wire Rope

*is like old-fashioned "Rhumatiz"*



The bearings just don't work. Hence flexibility is lost and the extra bending load from this stiffness quickly destroys the individual wires. A corroded rope is a dangerous rope to use. If the wires of a rusty rope are still in good condition, the rope may be salvaged. A thorough treatment with a penetrating lubricant will free the bearing surfaces and permit the wires to slide by each other when the rope is flexed. But no amount of oil can replace worn surfaces. The best thing is . . . don't let your rope get "Rhumatiz". Wire Rope is made with proper oil impregnation of the hemp centers and ample slushing of the wires inside and out to assure proper lubrication during storage, marketing and initial use. Protect it by greasing the surface during use and enjoy the longest possible service from Wire Rope.

## WICKWIRE ROPE

### WICKWIRE SPENCER STEEL COMPANY

General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

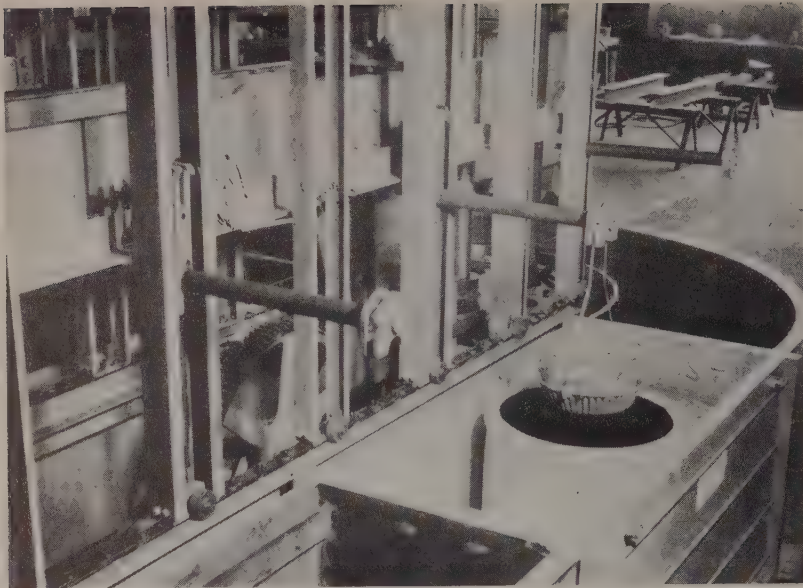


Fig. 2—Closeup and side view of new conveyor on automatic bright dip setup. A carrier is being lifted by the elevator here. Note every other set of vertical guide bars is not used. This means capacity of arrangement shown can be doubled by adding other carriers between those shown

ment of the structure, or elevator as it is called, provides ample clearance when advancing the work from tank to tank. This elevator structure is counterbalanced and slides on vertical guide tubes moving up and down through a fixed distance. Since it engages all carriers, any vertical movement is transmitted directly to the work in the solutions.

Drives to the conveyor chains are interlocked with the elevator mechanism so when elevator reaches its top position and all work is clear of the solutions, the horizontal chain moves forward one carrier spacing before the elevator is lowered.

Regardless of the number of treatments in the cycle (number of solutions), there is only one lift—the elevator. In principle it operates like any elevator, having a counterbalance to offset the weight of both elevator structure and carriers as well as load being lifted. Height of lift can easily be adjusted, and light loads or heavy loads work equally well with this arrangement.

The elevator mechanism may be actuated by hydraulic cylinders using a geared motor to drive the conveyor chains advancing the carriers from station to station. Also in some applications, a horizontal cylinder may replace this motor drive so the entire machine is hydraulically actuated.

Elevator also may be driven with a crank and connecting rod arrange-

ment rotating through 360 degrees in raising and lowering the elevator. Part of the crank travel then is utilized to operate a lever that moves the chain forward, thus advancing the carriers. This is the type of drive on the machine shown.

Elevator mechanism also may be gear driven through a chain on sprocket drive. In this case a separate drive geared to the forward drive chain moves the carriers from one station to another. Of course in any case, both forward and elevating drives are synchronized.

#### Work Agitated

In high-speed plating solutions, it often is desirable to oscillate the work as this permits high current densities, more uniform action of the plating bath and thus more uniform results. Also some agitation is highly desirable in cleaning solutions to assure maximum activity of the solution. Such oscillation or motion is easily provided in the elevator conveyor by a short up and down stroke, or it may be incorporated in the forward drive chain by moving the carriers forward and backward through a short distance while the work is immersed in the solution. Also, treatment times may be varied easily, and a fixed transfer time still maintained.

Fig. 1 shows end view of a bright dip conveyor with a basket being transferred and about to be lowered into a solution. During next transfer it will advance to a similar position on the opposite side of the division wall separating adjoining tanks. Transfer time on this particular equipment is 4 seconds. The dwell time is 10 seconds; that is, the work is immersed in the solution 10 seconds before being transferred. Pro-

duction rate is one basket every seconds.

This capacity can be doubled by filling the vacant vertical guide tubes with the machine with carriers or tanks. Fig. 2 is a side view of the machine shown in Fig. 1 but it gives a better view of the elevator mechanism. In this machine, the elevator is driven by cranks and connecting rods in turn connected to the gears one of which is shown immediately under the elevator.

Conveying equipment described above is extremely flexible; the speed of lift and transfer can be varied over a wide range. The spacing of carriers on the forward chain also can be changed to accommodate various solution tanks. Of course all tanks in a machine must be of same size or multiples of size so the lift, transfer and leveling mechanism synchronizes properly.

## Glass Glare Eliminated

■ Glare from reflected light has made it difficult at angles to see pictures framed in glass, has been removed by a process developed in the Electric research laboratory, Schenectady, N. Y. Application of a thin chemical film to the surface of glass nullifies or neutralizes bounding light rays with reflections. Pictures framed with glass so appear as though there is no glass at all, regardless of from which viewed. The surface is true with clock faces, show display windows; in fact, anywhere where glare is caused by light reflections on glass.

The refractive index of the film having been determined, a transparent film of about 4 millionths of an inch, or exactly one wave length of light, in thickness is attached to the glass. As light falls upon film, those rays reflected from the outer or upper surface are equal in intensity and opposite phase to those reflected from the lower surface, and thus they cancel each other so no light is reflected.

## Affirms Simplified Practice

■ The current revision of the simplified practice recommendation R32, grinding wheels, has been recorded the required degree of acceptancy and became effective June 1. The revised recommendation is now identified as simplified practice recommendation R45. It may be obtained free of charge from division of simplified practices, national bureau of standards, Washington.



# Saving the Surface

New process heat treats all types of work in same protective atmosphere, obtained with simple equipment, thus eliminating problem of determining and obtaining correct type of atmosphere for each kind of steel handled

By R. C. ONAN

Lindberg Engineering Co.  
Chicago

DEVELOPMENT of a new process Lindberg Engineering Co., Chicago, affords a method of heat treating a wide variety of steel without adjustments of the protective atmosphere to accommodate the types of steel or temperature employed.

Known as the Hydryzing process, the equipment was first tried out in production line in the tooling department of Lindberg Engineering Co. before being commercially announced. This was a notably stiff testing ground because every week sees hundreds of different steels hardened in this department. A few days of operation were generally sufficient to show any deficiencies in a furnace.

Results of this test indicated that the single furnace atmosphere employed in the Hydryzing process is sufficient to cover the complete range of steels encountered in heat treating and hardening work. After a few weeks of operation, it was found that the hardeners were using the Hydryzing furnace to full capacity, asking for a similar furnace of larger size to accommodate more dies. There were a number of reasons for the quick and hearty acceptance of this new process.

## Work Free From Scale

Probably the most important result of the Hydryzed work has not even the slightest trace of scale. All surfaces come out clean, and as a result the quenching medium cools the work faster and gives full hardness. Tool and diemakers were quick to comment on the reduction

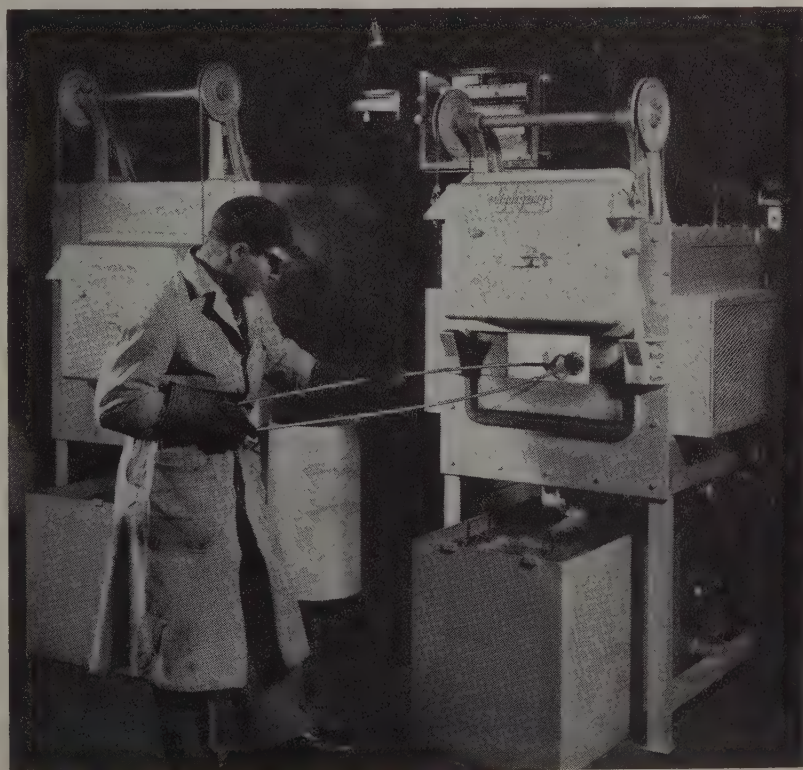
in cleaning or polishing time on their dies. On production work such as springs, can opener blades, metal stampings and the like, tumbling or sandblasting has been eliminated with a consequent reduction in cost. In the case of the can opener blades, for example, the customer was able to secure a much better and smoother plating job because the roughening effect of sandblasting was eliminated.

Most hardeners endeavor to control the atmosphere in their furnaces by balancing fuel and air ratios to establish oxidizing or reducing atmospheres within the chamber as may be required. Some operators have found an excess of oxygen

best for carbon and nondeforming tool steel because in spite of a scale formed on the surface, the tool hardened in an oxidizing atmosphere was fairly certain to come out hard when quenched.

Similarly, it was found that many of the chromium steels do better in a reducing atmosphere, but the question always has been "how oxidizing, how reducing?" Because it is extremely difficult to judge atmospheric conditions by eyesight alone, and because of the presence of water vapor in the products of combustion, many fine tools have been pitted or decarburized in spite of the hardener's skill.

In the Hydryzing process, the



—Preheat and high speed Hydryzing furnaces at work

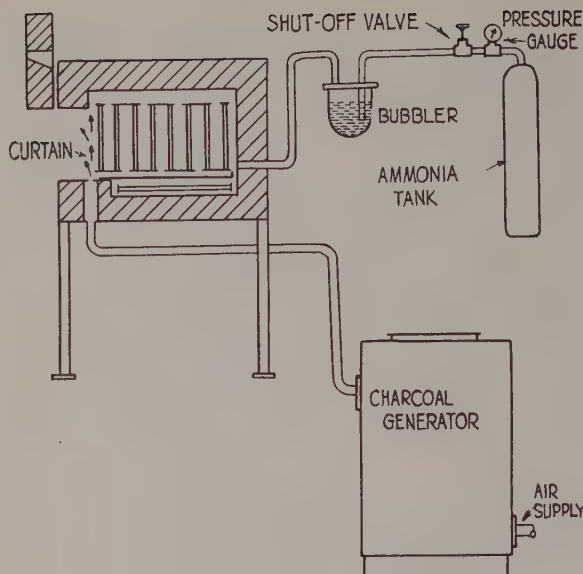


Fig. 2—Schematic diagram of Hydrying process equipment

problem of determining and obtaining the correct atmosphere is entirely eliminated as the same atmosphere is used for all types of work. Hydrying is a process for heating metal in hydrogen coupled with a simple and effective method for keeping the hydrogen from combining with oxygen to produce water vapor. Hydrogen is used as a protective medium for all steels, regardless of analysis. The hydrogen is introduced into the furnace in the form of anhydrous ammonia which immediately breaks down into free hydrogen and nitrogen at the furnace temperature.

To assure that the hydrogen is protected at all times from contact with the air, full protection is incorporated in furnaces using this system by employing a simple curtain of combusting gas at the opening of the furnace. Gas for the curtain is produced in a charcoal generator through which air is drawn or forced under pressure. The resultant gas is introduced to the furnace through a slot in the hearth at the vestibule. Ammonia is supplied from standard ammonia tanks readily available in every locality.

Fig. 2 is a simplified schematic diagram showing arrangement of equipment employed in the hydrying process. Gas from the ammonia tank is fed through a pressure gage and shut-off valve to a bubbler unit which indicates flow of gas into the furnace. The charcoal generator, connected to an air supply, furnishes combustible gas which seals the doorway of the furnace against entrance of air and dilution of the protective atmosphere.

The furnace itself may be either

one of two types. For maximum temperatures of 2000 degrees Fahr., a furnace electrically heated by tubular type heating elements is employed. This is suitable for carbon and alloy steels as well as high-carbon and high-chromium steels. Hydrying furnaces for high-speed steels are equipped with Globar type heating elements and have a maximum temperatures range of 2500 degrees Fahr.

Since atmosphere for both the low-temperature and high-speed furnaces is identical, a number of furnaces can be supplied from a single charcoal generator. Similarly, a bank of furnaces can be supplied from one source of ammonia, if desired. Fig. 1 shows such an installation where a single charcoal generator supplies both Hydrying furnaces.

#### Master Embossing Dies Treated

The protective atmosphere employed in the Hydrying process has been found satisfactory for the most exacting jobs. For instance, master embossing dies, previously pack hardened, are hardened in Hydrying process equipment with superior results. Such dies generally have a myriad of fine, delicate raised surfaces which would be completely ruined if scaled, decarburized or carburized. For this reason, such work is usually pack hardened, but the very real danger of carburizing these delicate raised surfaces is always present. When this happens, the surface becomes as brittle as an eggshell, so preventing such a condition is extremely important. Hydrying has been used for such work with complete satisfaction and freedom from scaling, decarburizing or carburizing.

Blanking dies, punches, produc-

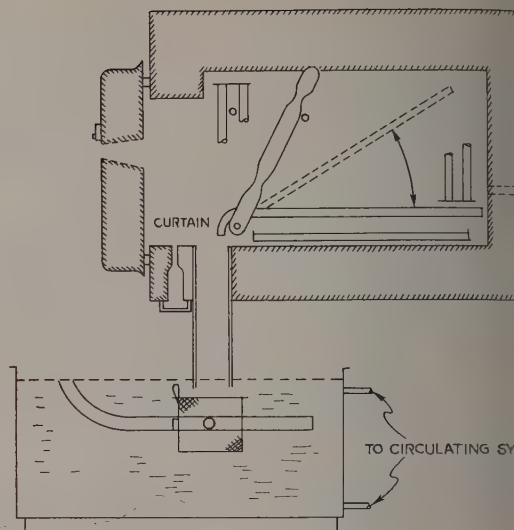


Fig. 3—Tilting hearth Hydrying furnace quenches work without contact with air by dropping through slot into quench as shown here

tion parts, springs, jewelry, machinery parts, heading dies, gears are just a few of the parts which have been treated the Hydrying process with satisfaction. In all this work changes or adjustments to the atmosphere have been required.

#### Adjustments Eliminate

From a practical standpoint, the Hydrying process is extremely advantageous as it eliminates all necessity for adjustments as well as for the priming of best types of atmosphere for a certain type of work. This simplicity of Hydrying is one of its important advantages.

The complete elimination of decarburization has meant increased life of dies and tools in a good number of instances. Likewise, elimination of decarburization or "soft skin" is of great importance on many types of work.

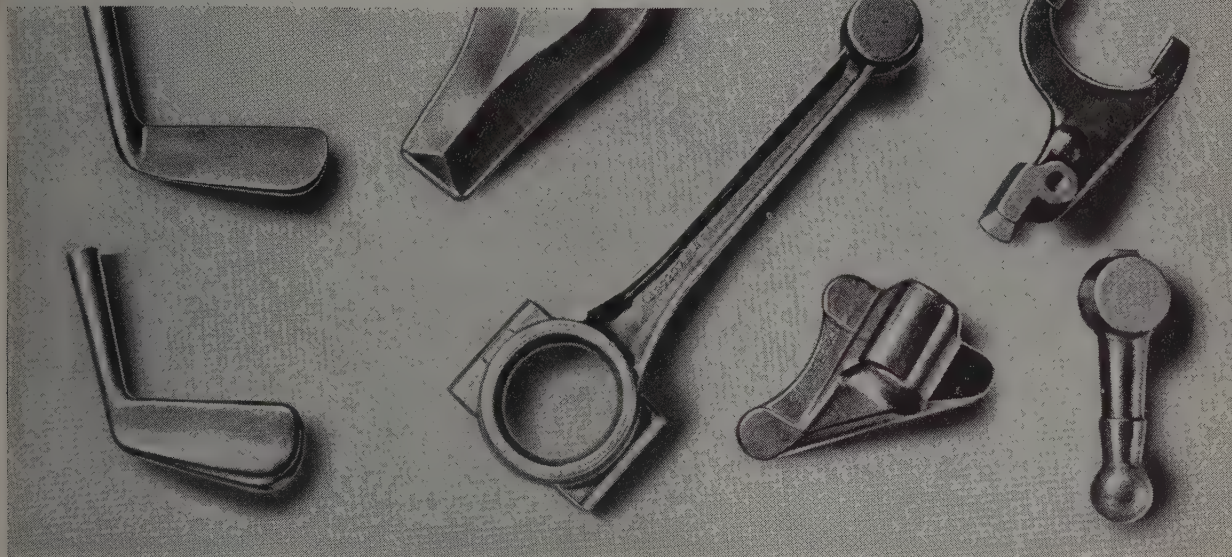
To handle most efficiently large volume of small parts, a variety of the standard furnace has been designed which has been found particularly advantageous. For instance, in treating of springs, an opener blades, the work can be dumped directly from the furnace into the quench tank without being exposed to oxide atmosphere.

This is made possible by the use of a tilting-hearth Hydrying furnace sketched in Fig. 3. The hearth is hinged at the front and a lever runs to the back of the furnace permitting the hearth to be tilted when desired so that the work will discharge through the

(Please turn to Page 6)



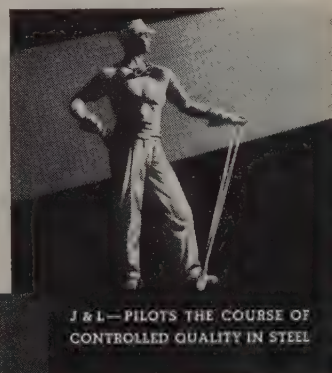
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# Work-Temperature Control

Furnace temperature is varied automatically to maintain a uniform temperature of metal heated, thus obtaining greatly increased uniformity in rolling. New control system uses temperature of work as controlling element. System also applicable to heat-treating furnaces where it improves results

■ IN THE new rolling mill of Bridgeport Brass Co., Bridgeport, Conn., a slab-heating furnace has been equipped with a new type automatic temperature control which is producing much more uniform results and which is proving to be a great aid in rolling. The principle of the new type control is that to maintain accurately the temperature of the work discharged from the furnace, the heat input, i.e. the fuel supply to the furnace, is varied and controlled by the actual temperature of the work about to be discharged from the furnace.

This furnace is of the heat-head type where temperature of the furnace is higher than temperature of work at discharge. This means that accurate control of work temperature by controlling furnace temperature is possible only when a number of important factors are held constant. Thus, mill activity must remain uniform and rate at which

work travels through the furnace must be held constant. Also, other factors such as absorption of heat by furnace walls on starting, changes in room temperature, etc., all must be held constant if the work temperature is to be uniform. Obviously, it is impossible to control all these factors to a sufficient degree so work temperature at discharge is uniform under actual operating conditions.

## Discharge Temperature Controlled

It is this situation that has brought about the development of the new control system installed here. In most industrial furnaces it also is desired to control the temperature of the product at discharge rather than the temperature of the furnace itself, but available control equipment has largely confined automatic control to control of furnace temperature. Also, use of thermocouples installed in furnaces to give furnace temperature has been

found to give many variations to their being influenced by the impingement of flame and radiation from walls of furnace.

In the new control system at the Bridgeport works, the temperature of the work itself is used as the controlling element to vary the temperature of the furnace in a manner as to compensate for variations in amount of work passing through the furnace and other factors, thus holding temperature of work at discharge at a constant value.

In this furnace, heating slabs in the hot-rolling mill, desired temperature of work at discharge varies from 1450 to 1750 degrees Fahrenheit depending upon the kind of metal being handled. The furnace is approximately 24 feet long and 12 feet wide. Preliminary heating is by eight burners, four on each side wall with a thermocouple located 12 feet from the charging end. The discharge zone has four burners on the charge end wall and four burners on the side walls, two on each side wall. A controlling thermocouple for the work is located in the center of the furnace, approximately 5 feet from the discharge end and over the final position of the work prior to discharge. The feed is by oil hydraulic press. Three rows of slabs are heated on a slight incline, using noncooling skids. Discharge is by gravity. (Fig. 2.)

As first installed, the furnace was divided into two zones, was controlled automatically by the two thermocouples in the two zones. In

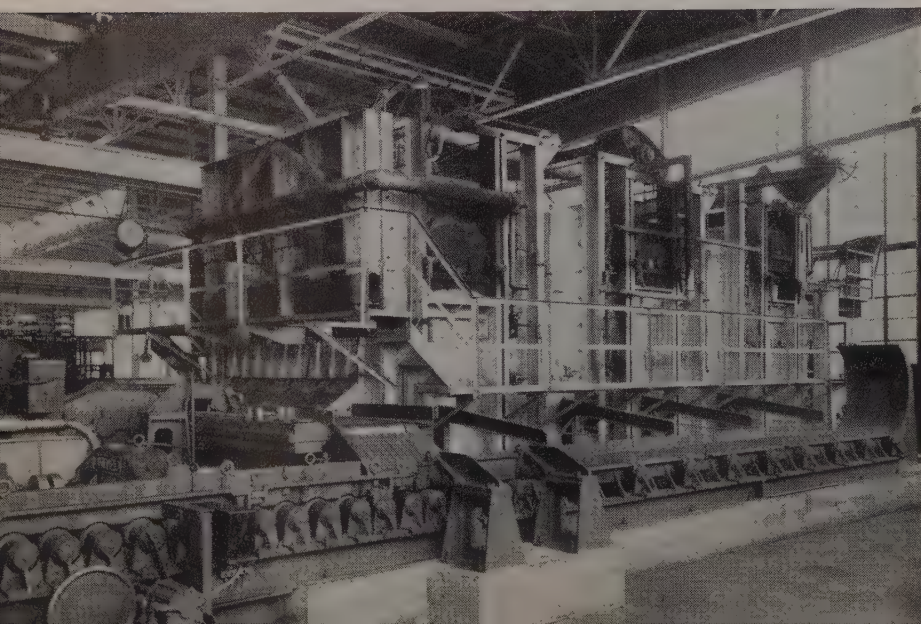


Fig. 1—Heating furnace at Bridgeport Brass Co.'s new mill where work temperature control system is utilized for improved rolling



to obtain greater uniformity of conditions, it was decided to use a radiation type pyrometer tube to measure temperature just prior to discharge to see if this could be used as an element to operate the furnace and thus obtain more uniformity of work upon discharge from the furnace.

Working out this improved system, it was desired to study the difference in thermocouple and Rayotube readings, using values obtained by an optical pyrometer on the furnace immediately after discharge as a check on both thermocouple and Rayotube readings.

A Rayotube was installed on the furnace and sighted down through an open-end tube onto the furnace. A blower line connected to the top end of the tube provided a slight downward draft of air within the tube at all times. At the bottom of the open-end tube, a hood was placed to shade the Rayotube from surface reflections from the slab, thus preventing reflections from the slab from influencing Rayotube readings.

Tests of this system were run with this method. Rather than present the results and somewhat complicated details of these tests, the results of the tests will be discussed.

#### Test Results Accurate

Accuracy of Rayotube readings and sensitivity to temperature changes were evident in all the tests. Tests on slabs as they came from the heating furnace showed excellent correlation with the thermocouple readings, in most cases within a few degrees. At no time did Rayotube records show any difference from flame or smoke within the furnace. All during the tests the furnace flame was regulated, from intermediate, to off, and back on again. These changes are unreflected on the records. At one time the furnace was filled completely with smoke, yet no effect was shown on the records.

The sensitivity of the Rayotube was indicated by drops as each cooler slab came into observation.

It was evident an extreme lack of consistency between the thermocouple and furnace temperature records when the Rayotube and optical pyrometer values were compared.

In one instance, the records show that when the furnace was cooled the Rayotube temperature rec-

ord started to drop almost immediately, whereas no noticeable drop in the furnace temperature took place until about 40 minutes later. Similarly, on another set of curves, changes were detected by the Rayotube which were hardly noticeable at all in the record of furnace temperature. In another case, a definite increase in work temperature was noticed during a drop in furnace temperature. There are, of course, explanations for these inconsistencies which need not be gone into here. However, these do indicate that the temperature of the work does not vary with the furnace temperature, and consequently that furnace temperature cannot be used as a control index for determining the temperature of the work.

There were many indications on the records which showed the effect of flame on the thermocouple often causing just the opposite action from that desired. In one case, for instance, while work temperature remained constant, furnace temperature rose and fell according to whether the flame was on or off. In another case, work temperature dropped through unusually heavy demand which even full fuel-firing rate could not meet, and yet the indication of furnace temperature as afforded by the thermocouple showed furnace temperature to remain constant, obviously an incorrect indication.

To check accuracy of Rayotube readings as a control index for operation of furnace, the control wires were shifted to the Rayotube recording controller. Records clearly show

that continuity of product temperature obtained with this arrangement was much better than ever obtained before. Optical checks substantiated this. Mill operators remarked about uniformity of the temperature. Changing the control point to a new setting showed an immediate response, substantiated by optical checks.

#### Preliminary Zone Checked

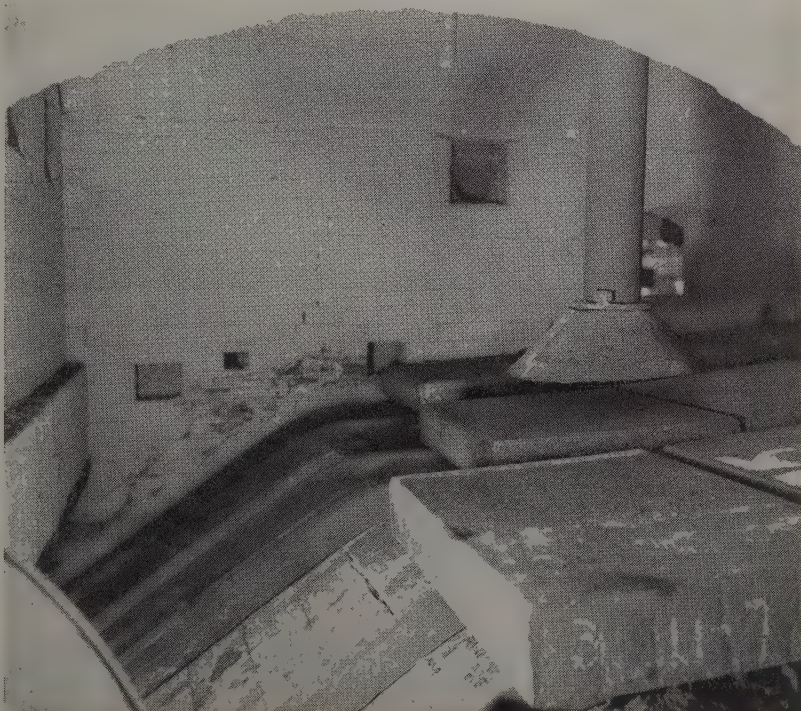
An unexpected result from tests was the guide that Rayotube readings were found to afford in operation of the preliminary zone where the slabs are first heated.

Due to extreme sensitivity of the Rayotube indications, if the slab is hotter in the preliminary zone than it is in the final zone, this is made evident by the sawtooth curve produced as slabs advance through the furnace and caused by a drop in temperature as the material passes through the final zone.

Similarly, if the preliminary zone is cooler than the final zone, this will be indicated by a sawtooth curve with the teeth at opposite angle showing a rise in temperature as the slabs lie in the final zone.

The third possibility, where the slabs are heated to the correct temperature in the preliminary zone and simply held at this temperature in the final zone, is indicated by a smooth curve on the Rayotube record showing no sudden increase or drop in temperature as the slab rests in the final zone.

Thus, from these records it became evident that in the first case the con-



View of sighting tube from furnace. Rayotube element is above furnace roof and sights into slabs through tube shown. Hooded shade prevents reflection from affecting indications



trol setting of the preliminary zone should be raised, lowered for the second case and remain unchanged in the third case, which produced the results desired.

From the extremely satisfactory results obtained with the setup, it was found other improvements in furnace operation were possible. For instance, many industrial furnaces are of such width that temperature variations may occur across their width. In the particular furnace used here, three rows of slabs are heated. The middle row furnishes the index for control, and first and third rows drift along with this control from the center row. The final step to create uniformity between rows of 1, 2 and 3 across the width of the furnace simply involves a means of detecting comparative temperature differences and a means of providing more or less heat on one portion of the furnace width than on another.

If width of the furnace is sufficient, a number of independent, automatic controls could be installed across the width of the furnace, each operating its own set of burners in a manner similar to the individual controls described above.

With this furnace, however, it was not considered necessary, and it was decided to install equipment to detect lateral differences and to correct these by manual adjustment of the burners across the front wall of the furnace. This provided the uniformity desired.

## Elastic Properties of Cast Iron

■ An optical method for measuring deflection of cast iron transverse test bars up to the breaking strength has been developed by the metallurgy division, national bureau of standards, department of commerce, Washington. Deflection is determined by measuring distance between a reference point and a rubber band mounted on test bar.

Irons were heated to maximum temperatures of 2552, 2732, 2912 and 3092 degrees Fahr. Test bars 1.2-inch diameter were cast vertically, bottom poured in green sand molds at 180, 270, 360 and 450 degrees Fahr., above the liquidus temperature. Transverse properties of test bars were determined by interrupted loading and by direct loading up to breaking load. Lowest and highest elastic properties were observed for maximum heating temperatures of 2552 and 3092 degrees Fahr., respectively. These properties showed a tendency to decrease with an increase of pouring temperature.

The microstructure of the test bars was examined. Comparatively fine graphite particles, which are

associated with higher transverse properties, were discovered. A laminated, pearlite-like structure observed on some unetched specimens and the presence of large graphite particles subdivided into hexagonal-like grains are of particular interest.

## Value of Microscope in Iron Metallurgy

■ *The Microscope in Elementary Cast Iron Metallurgy*, by R. M. Allen; waterproof cloth, 160 pages, 6 x 9 inches, 75 illustrations; published by American Foundrymen's association, Chicago; supplied by STEEL, Cleveland, for \$3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

This book is an enlargement of material presented in a series of lectures at the 1939 convention of the American Foundrymen's association at Cincinnati. It is written in simple language, to be understood by the novice as well as the expert. The effort has been to show the practical man there is nothing particularly difficult about fundamentals of metallurgy, the microscope, its use, or interpretation of photomicrographs if such fundamentals are understood.

The first section deals with value of the microscope to the cast iron foundrymen and deals with fundamentals of physical cast iron metallurgy, using simple analogies. Then follows explanation of the be-

havior of sulphur and phosphorus and how they can be identified and the effects on properties of the metal. The author then deals with white, chilled, malleable and alloy irons.

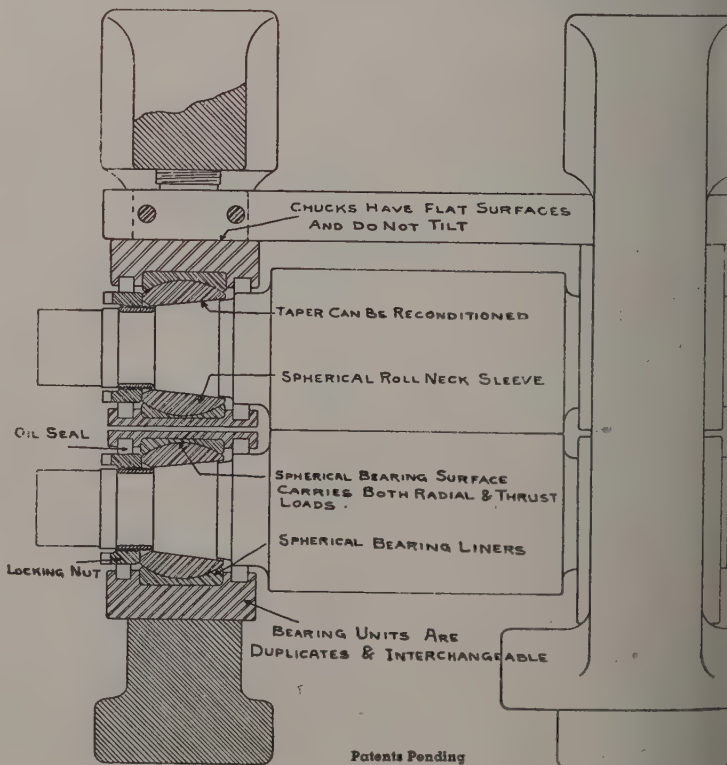
The next section is devoted to equilibrium diagrams, starting with simple binary diagrams and explaining how the same principles can be applied to more complex diagrams, particularly the iron-carbon diagram.

In the final chapter the scope and technique of its use are discussed. Its parts are explained and the function of each. Considerable space is devoted to techniques in focussing, photographic processes, photographic papers, reagents and sample preparation.

## Adds Spherical Bearings For Rolling Mill Use

■ Spherical bearings of the aligning unit type, adapted for use with grease, have been designed recently by Spherical Bearing Co., Erie, Pa., for application to blooming, billet, structural, merchant, pipe, rod and plate of all 2-high, 3-high and 4-high types and sizes for either hot or cold rolling. These bearings are designed to fit either neck or bottom rolls in any stand and can be applied to existing

Diagram showing structural details of a new spherical bearing, designed for application to rolling mill





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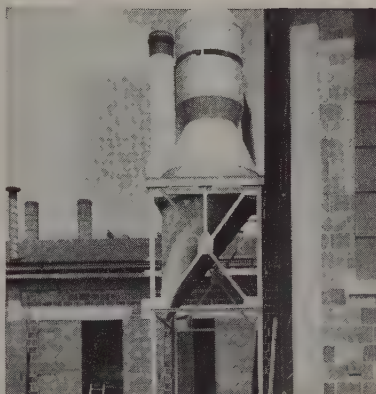
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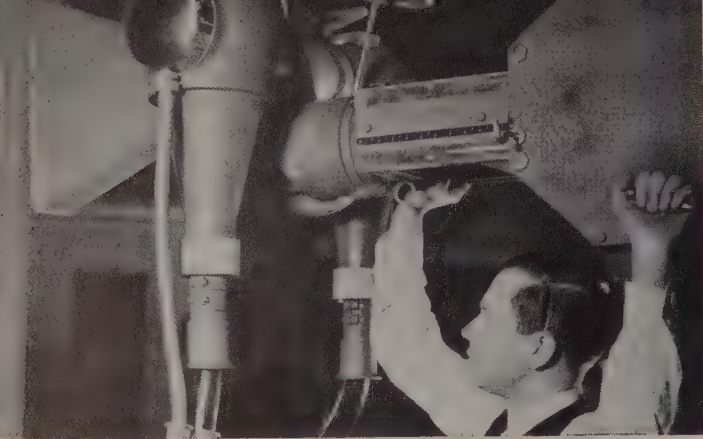


Sturtevant Dust and Refuse Collecting System for carpenter shop.



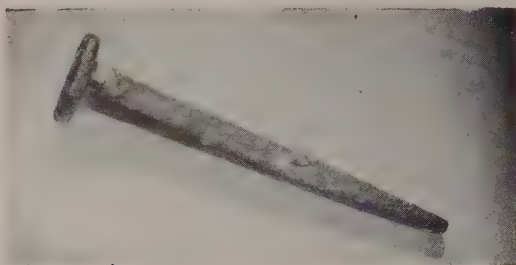
Sturtevant Fume Removal System for carrying off fumes from plating and other baths.

## **FOR DUST AND FUME REMOVAL**



## X-Ray Flaw Detection Is Easier

■ Technique of radiographic analysis of large steel parts is expected to be simplified greatly by this new 4500-pound portable X-ray camera or flaw detector. It may be wheeled along production lines, is shockproof, completely self-contained, generates X-rays sufficiently strong to pass through 3 inches of steel. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



## No Rust in Over Half Century

■ Picked up near Tricheelers, Pa., this 55-year-old wrought iron shingle nail demonstrates the value of heavy galvanizing. It gave 39 years service on the roof of a quarry building and had lain on the ground 16 years. Although galvanizing was quite irregular after this long exposure, a heavy coating still remained to protect iron from rusting. Photo courtesy New Jersey Zinc Co.

## Flying Micrometers Check Gage

■ Material passing through this shearing line of tin plate mill of new Irvin works of Carnegie-Illinois Steel Corp., near Pittsburgh, is constantly checked for correct gage by flying micrometers. These units actuate sorting mechanisms on the pilers through time-delay relays to throw out off-gage sheet automatically. This limits stack of plate to sheets within definite gage limits



# Quality

## In Steel

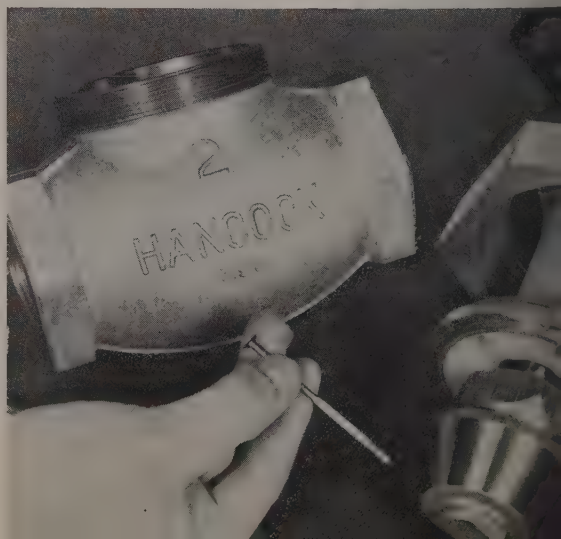
## Finds Pinholes Moving 1000 Feet Per Minute

■ Holes one-third the size of a pinhole are detected and marked on this machine on sheet strip running at speeds up to 1000 feet per minute. Hole-finder consists of a light source, photoelectric cell, an amplifier, a thyatron control panel and a marking device. The machine also may be used on plastics, or other opaque materials such as rubber-coated cloth. Photo courtesy Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.



## Valve Smashes Nail Without Damage

■ This "500 brinell" valve, made by Hancock Valve & Mfg. Co., New York, employs stainless steel seat and disk. Smashing the nail shown between these two parts leaves no trace on either valve part. Taper boring the seat and disk when turning the mating disks is done so accurately that an interference fit is secured. No lapping is required. Valves pass 100 pounds air pressure under water for 24 hours without showing a bubble. Photo courtesy Ex-Cell-O Corp.





# Convention Celebrates Hundredth Anniversary of Electroplating Art

CELEBRATION of the 100th anniversary of electroplating was one feature of the twenty-seventh convention and second international conference of the American Platers' society at Hotel Carteret, Asbury Park, N. J., 19-22. This meeting was the first in the organization's history, registration reaching 600 and representatives from England, Canada, and other countries attending and participating in the convention.

The convention was conducted under the sponsorship of the society's New York, N. J., branch, of which John H. Hull is president. Among the speakers was Charles H. Proctor, president of the society. C. S. Taylor, president-treasurer, Boston Electroplating Co., Boston, ex-mayor of Boston, Mass., and bank president of the latter city, was introduced as the dean of electroplaters, having been engaged in the art for more than 65 years. Mr. Taylor, in his eighty-fourth year, displayed electroplated specimens coated in gold and silver which won medals in exhibition that year.

## District Branches Sponsor Exhibits

Display of plated finishes and demonstrations was held during the convention. Each district branch of the society was represented with an exhibit.

History of steel for electroplating was told by Frederick Fulworth, of the Electric Co., Philadelphia, who showed a moving picture of strip production in the plant of the Newnan-Crosby Steel Corp., New York, R. I. All steps in the production of cold strip specialties, including handling of hot coils to shipwreck were covered.

Electrodeposition of black molybdenum finishes was discussed in a technical paper contributed by R. A. Hull and R. O. Hull, E. I. duPont de Nemours & Co., Cleveland. Mr. Hull indicated that deposits of molybdenum are likely to vary unless the process is carefully controlled, improved practice has made possible deep black deposits, the depositing rate at a high rate, approximately 21 times that of nickel. Operating conditions for molybdenum nickel include temperature of 170 degrees Fahr.; current density, 2 to 5 amperes per foot; and hydrogen-ion concentration, 0.5; in a rubber-lined tank.

Thickness of deposit of 0.001 inch per minute is attained. The throwoverpower of the solution should be determined according to Mr. Hull. At 5

amperes per square foot this is 81.7 per cent and at 15 amperes 88.5 per cent. Black molybdenum, he said, will plate into deep recesses, has low density and the advantage of rapid deposition. With zinc, deposition by immersion is possible in the absence of nickel, but appearance is better with nickel.

In a second paper, covering current density range characteristics, Mr. Hull described in detail the workings of a plating test cell using 1 quart of solution. Routine tests at various intervals on any solution, he favors. In the plating test cell two types of cathodes are used—copper and cold-rolled steel—and tests range from 10 to 15 minutes. From 3 to 5 amperes are employed, depending upon the type of solution. Current density distribution on the cathode plate for any solution is measured.

Agitation breaks up concentrated layers of solution and keeps concentration more uniform, yet as a result of the current flow, movement in one direction continues to a certain degree, according to J. T. Burt-Gerrans, Toronto university, Toronto, Ont., who reviewed diffusion in electroplating process. Temperature and current density are vital factors, the former when in the higher scale increasing diffusion, also allowing an increase in current density. Addition of salts and other solutions will reduce the latter. Current, he claims, is the driving force in each diffusion.

## Outlines Training Procedure

A good working knowledge of mathematics, physical metallurgy and electro-chemistry is the basis for theoretical training for the electroplating industry in the opinion of Dr. J. U. MacEwan, Birks professor of metallurgy, McGill university, Montreal. Laboratory work was also stressed, Dr. MacEwan pointing out the progress made in the extension of technical courses at many universities.

Greater use of the ampere-hour meter was urged by Burton G. Daw, president, LaSalle Inc., St. Louis. This meter, he said, can be used as an indicator as to what is needed in plating solutions and more along lines of solution control. While it is still desirable to run tests, the meter is nevertheless a check, he said. It also aids in calculating costs and inventory.

Value of chromium for building-up worn parts and tools lies in its resistance to wear, according to D. A. Cotton, director of research, Delco

Remy division, General Motors Corp., Anderson, Ind., who cited many concrete examples of savings made in the chromium plating of worn dies, gages and tools. Gages frequently are plated to oversize to allow grinding to size and a coating of 0.001-inch is given plastic molds and dies. In plating molds a special anode is used, the unit being approximately the same shape as the work. Mr. Cotton declared the plating department at his works now handles close to 160 types of tools, building up worn taps, reamers, drill jigs, cams, field, gages, dies and molds, and other tools, at a great saving in production time and turnover.

Files plated with chromium wear from three to four times longer than unplated files, the speaker asserted. Plating of bearing parts of machine tools also has resulted in substantial saving of money and production time. In a plastic molding operation, presses operating at pressures of 2000 to 6000 pounds, severely test the rams. He finds that by chromium plating the rams friction is reduced and as a result less packing is required. Mr. Cotton told of a chromium-plated die which after a run of 700,000 parts was still operating satisfactorily when removed.

## Follows New Practice

Plated parts are often so close to size that little or no grinding is required. In operation several old methods have been disregarded, according to Mr. Cotton, work being taken out of the tank several times during a run and several parts or tools being plated at once. Cleaning is done by reverse current, but this should not be continued too long, he said, to avoid gas evolution. Most work is done at a potential of 4 to 5 volts. He stressed the importance of bringing the work to the temperature of the bath before starting and beginning with a low current density and reverse current for cleaning. Protection of areas not to be plated is afforded by use of lacquer and tape. In general, he said, cast iron requires a higher current density than other metals and the anode should be close to the work.

Anodic coating of aluminum is oxide in character, the film on the aluminum being substantially aluminum oxide, according to Dr. Junius D. Edwards, assistant director of research, Aluminum Co. of America, New Kensington, Pa. The coating is generally in a sulphuric acid electrolyte. Presence of silicon in the metal shows black or other color spots in oxide coatings and alloys having a substantial element of copper have a bad reputation as subjects for oxide coating, according to Dr. Edwards. These types of coatings also are liable to absorption and can be colored by the use of

dyes. Exposed to the sun, however, dye-colored work is subject to fading; impregnation of the film with mineral pigments gives more satisfactory results. By the use of hot water, oils or waxes it is possible to seal these coatings to prevent porosity.

Oxide coatings will crack when the metal is bent, but will not flake off, according to Dr. Edwards. Cohesion is intense. There is a differential in expansion in the coating and metal under too high heat-treatment, he declared. The most prominent use of the coated material has been in architectural work, notably spandrels.

Herbert R. Isenberger, St. John X-Ray Service Inc., Long Island City, N. Y., urged a greater study of the application of X-ray diffraction to electroplating problems, notably in research covering bright nickel deposits. In discussion it was indicated that nickel-cobalt coatings are more uniform as to grain structure and therefore more ductile in character.

Bright dips should attack uniformly all elements of the alloy being worked in the opinion of Dr. Walter R. Meyer, editor of *Metal Industry*, New York. He discussed bright dips for nonferrous metals, and said most such dips were oxidizing in character. Use of chromatic acid decreases gas evolution, he said, reducing fumes, but is used mostly for small articles of zinc, cadmium and copper. He stressed the importance of the rinse when this type acid is employed.

#### Studies Electrolyte Film

Current density, temperature and agitation in the average bath solution are important, but these factors do not tell the whole story in the study of electrolyte film, but are rather the result of what takes place in the film, according to Dr. A. Kenneth Graham, consulting engineer, A. Kenneth Graham & Associates, Jenkintown, Pa., whose research in the subject was made with Dr. Harold J. Read, instructor in electrochemistry, University of Pennsylvania, Philadelphia. Describing special apparatus used in the tests, Dr. Graham ventured the opinion that the decrease of nickel in such film was more or less connected with current density, nickel decreasing as the current is increased. Variation in the hydrogen-ion concentration also was stressed.

The opening session of the convention was devoted to papers by several experts connected with the Woolwich arsenal, London, most of these contributions being presented by phonographic recording. A. W. Hotherhall, director of electroplating research at the arsenal, however, was present, and discussed adhesion

of electroplated coatings, confining his remarks mostly to deposits of nickel on steel. Atomic adhesion, cleaning and the importance of pure solutions were stressed. He noted that progress had been made in electroplating equipment to a greater degree than nickel plating and other deposits, he said.

Distribution of deposits on cup-shaped articles was reviewed by recording by C. E. Gardam, research chemist, Woolwich arsenal, while recent developments in British plating practice were covered by C. F. Francis-Carter, manager, plating department, Serck Radiators Ltd., London. Chemical methods for testing metallic coating thicknesses was the topic covered by S. G. Clarke, research chemist, Woolwich arsenal. French contributions included a review of electroplating methods in France by M. Ballay, consulting engineer, Paris, and the chromium plating of wire by Dr. A. Guerillot, electrochemical engineer, Sorbonne, Paris.

#### Discusses Current Sources

The modern generator and rectifier as applied to the plating industry was discussed by Guerin Todd, chief engineer, Hanson-Van Winkle-Munning Co., Matawan, N. J., while time pieces, from sun dials to wrist watches, was the subject of L. A. Critchfield, Hamilton Watch Co., Lancaster, Pa.

A thesis on the study of nickel anode corrosion and loose nickel phenomena was read by T. P. McFarlane, graduate student, University of Cincinnati, Cincinnati.

John Geissman, Milwaukee, was elected president of the International Fellowship club which is connected with the society, and Thomas A. Trumbour, New York, was again named secretary. Membership includes manufacturers, distributors and representatives selling to the plating and allied industries.

The program during the day, June 21, was devoted to plant visitations, a large delegation being guests of the Hanson-Van Winkle-Munning Co., Matawan, N. J., and the Anaconda Copper Works, Perth Amboy, N. J.

### System Removes Fumes From Pickling Tanks

■ In an endeavor to control fumes from pickling and plating tanks which not only damage the building structure but which also are harmful when breathed, Heil & Co., Cleveland, has developed a method which takes up little space above the tank.

Fumes are removed through a slotted casing which extends around the top edge of the tank with the

duct down below the tank rising free headroom for hoisting conveying pickling crates. Fumes sucked through the slotted casing by a suction fan with a lead housing and monel fan blade accompanying illustration shows typical installation where fumes taken from two tanks. In this ducts around tank tops feed 20-inch diameter duct going to suction fan which in turn dis-



Closeup view of slotted draft casing exhausting fumes from pickling tanks.

into a 9-foot stack. Slotted casing is made of hard lead protected by angle iron frame to fan also is hard lead. Discharge stack consists of lead sections supported above roof by structural members.

### Forum On Re-Employment

(Concluded from Page 3)

struction industry is now in recovery cycle. While the spectacular phase of the current turn is a new federal public program, there is going on at the same time a revival of private building activity. The great depression behind us and many of the necessary financial adjustments motivated by the great deflation have been made. We have also come to believe that the latest recession also is behind us.

"Our past experience indicates that the first recession after the great depression is usually the one that frightens people the most. The last recession has cost some people a great deal, but it is a good thing to get the over-optimism of the first recovery wave and the excessive pessimism of the first setback. The industry faces its future realistically than it has been in the past ten years."

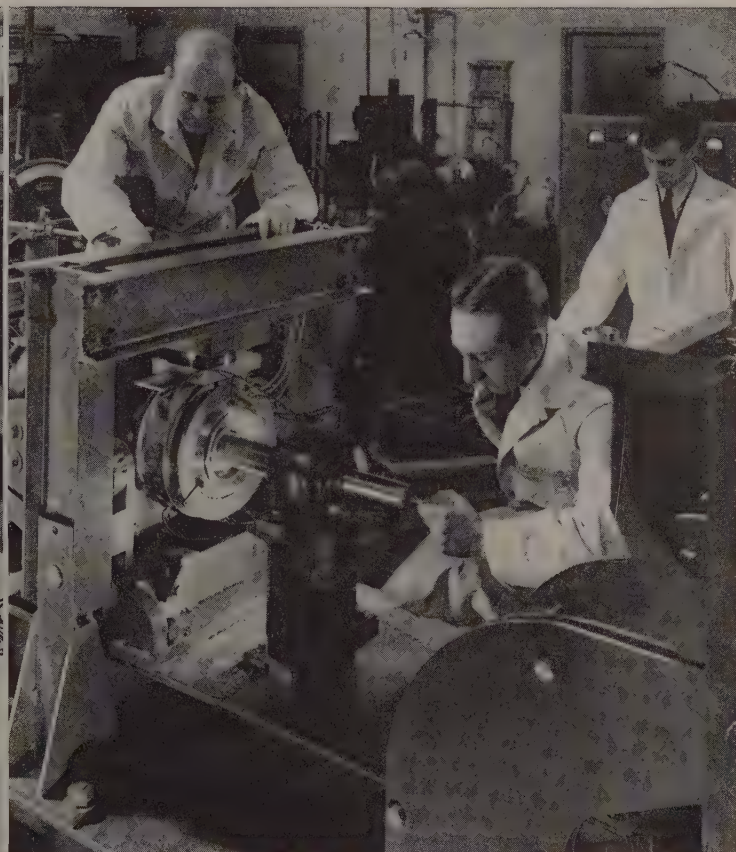


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lubricant under test. Thus, the knowledge gained by many years of practical experience in lubricating machinery of all types can be supplemented with newly developed facts.

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*Engineering and Construction Division*



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wasted. Whatever your plant problems are, it is possible that Koppers engineers have helped to solve similar problems before.

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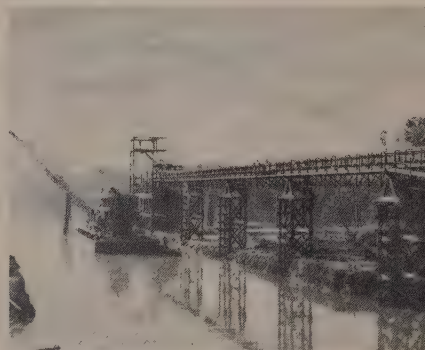
KOPPERS COMPANY, PITTSBURGH, PA.

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MATERIALS HANDLING PLANTS



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CONSTRUCTION



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150-60



## Weight Box Cars

(Continued from Page 45)

to the other to form a box space plates first are welded panels for bracing and two welded together into a re-box structure. Slipping one inside the other provides construction than a butt joint. Bolsters are mounted trucks and, with the sill, most of the weight and longitudinal shock. Two light formed Z-bar floor extending full length of Fig. 1, also are tack welded in. Underframe subassemblies in tack welded in position underframe-assembly jig, the underframe is lifted into the "jig, Fig. 5. In this the is supported at the ends so that it may be brought bringing all joints into or down welding when fill-

## Body Is Spotwelded

Completes underframe except ion of air-brake reservoir, om pressed steel ends and ate. Underframe now is receive the body which, in is practically of all spot- construction with some rivet- filling body to underframe mate footage of welding ing per car is as follows: ng, 1030 feet or 27.7 per t welding, 2601 feet or 70 riveting, 90 feet or 2.3 per

welding is by the shielded d using heavily coated elec- trode and size of welding rod ined by position, size of type of material. Especial ken in the design of jigs all downhand arc welding. n subassemblies, two or work at same time. Also, work only during tack- operation, except on the jig. This permits releasing jigs quickly and spread- ing filling-in operations. next week will describe on of sides, ends and top welding and assembly into eted car.

## The Surface

(Continued from Page 50)

ence into the quench tank . Use of this equipment found to produce an ex- ne surface finish. ese, delicate or heavy work d be damaged by dropping quench must be handled in

the usual way and is not suitable for a furnace of this type. However, there is a surprising large amount of work which such a furnace can handle at an increase in efficiency over the usual arrangement.

## Copper and Brass Parts Treated

In this particular design of Hy- drying furnace, a large number of copper and brass parts have been handled with excellent results. Such work comes from the furnace with bright clean surfaces. Quenching without contacting air, of course, is largely responsible for this. When dies or tools are taken from the furnace to be quenched, a slight, blue-black film results, but there is no scale. It has been found possible to use the tilting-hearth furnace for much general tool and die work with a significant increase in quality.

## Heating Quench Tanks Eliminates Soft Spots

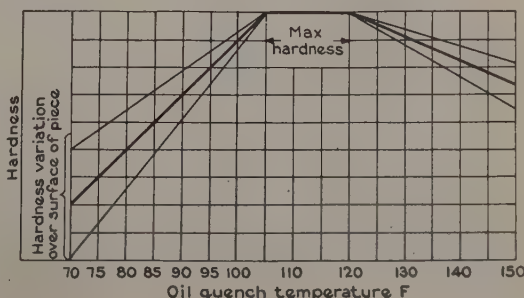
Recently the Geometric Stamp- ing Co., Cleveland, found that the temperature of quenching mediums had a lot to do with uniformity of hardened steel. The work might be the desired hardness, but soft spots might be scattered over its surface.

Knowing that these soft spots could be caused by bubbles forming on the work in the quench, an in- vestigation showed that this action followed a definite curve, shown in accompanying illustration. A quench temperature between 105 and 120 degrees Fahr. gave the best results with a minimum of soft spots, it was found.

With 12 kilowatts of electric midget heaters installed in the oil quench, this temperature can be attained in about an hour, which allows the operator to turn the power on the quench at the same time he charges the furnace.

Of course, on production work the pieces maintain the necessary tem- perature in the quench, and some- times it is desirable to cool it. How- ever, with intermittent or a small volume of work the electric heaters have aided in obtaining desired uni- formity.

This diagram shows how temperature of the oil quench bath effects the uniformity of hardness obtained. Chart courtesy General Electric Co., Schenectady, N. Y.



## Hard Facing Lengthens Life Of Dredge Parts

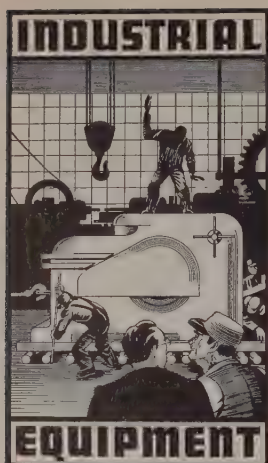
Dredge cutter blades and many parts of dredge pumps used on large power projects are now regularly hard-faced. At one location, according to the Haynes Stellite Co., New York, the life of hard-faced pump shells, impellers, face plates, and inside ells, was such that the pump



Hard-facing alloys on these dredge pump parts reduce maintenance costs and allow the parts to handle approximately 10,000,000 cubic yards during their service life

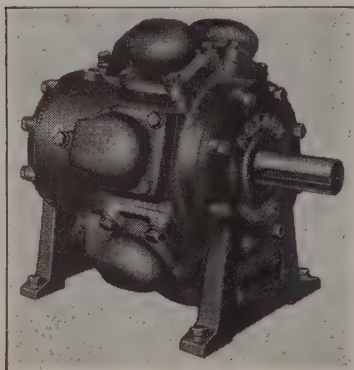
handled approximately 2,600,000 cubic yards before rebuilding of these parts was necessary. They could then be easily rehard-faced.

It was found that rehard-facing could be carried out economically about three times before it was necessary to scrap the part. Thus by judicious use of hard-facing, a total life of approximately 10,000,000 cubic yards was obtained. This is nearly four times the total life obtained before hard-facing was used. The accompanying illustration shows dredge pump parts which had their service life extended by hard-facing.



## Pump Speeds Elevators

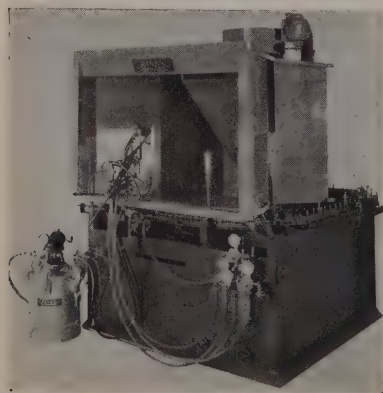
■ Rotary Lift Co., Memphis, Tenn., offers Rota-Radial pump, 7-cylinder unit with cylinders in a circle and pistons operating from an eccentric, having an efficiency over 85 per



cent with freight, passenger and sidewalk elevators. Elevators operate with motors of much smaller horsepower or give approximately 40 per cent more power or speed with a given motor.

## Spraying Machine

■ Binks Mfg. Co., 3114 Carroll avenue, Chicago, has introduced a standard spindle type automatic spraying machine for all types of automatic spray finishing for clocks,



battery boxes, lamp fixtures, etc. Three-way valve shuts gun on and off so it sprays only when following revolving products to be finished.

## Visor Shield

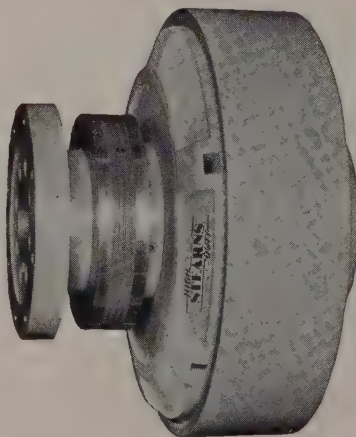
■ Jackson Electrode Holder Co., 15122 Mack avenue, Detroit, offers flexible, adjustable, transparent visor shield with stiffening metal binding around edge, spark deflector which protects opening between visor and forehead, and fiber head protector lined with fireproof duck.



Available in a variety of shades and lengths, it will not ignite spontaneously and is nonfogging. Hot metal rolls from shield. Visor is also available in monel-metal mesh.

## Small Magnetic Clutch

■ Stearns Magnetic Mfg. Co., Milwaukee, Wis., offers its small Style



"F" magnetic clutch and "FF" clutch-brake combination which can be supplied with collector rings on hub or on body. Units can be installed in field to replace jaw or pin clutches or other types of mechanical drives which can be replaced with magnetic devices.

## Superfinishing Head

■ Foster Machine Co., Elkhart, Ind., has developed superfinishing heads in three sizes for work up to several feet in diameter. Heads are mounted on compound of engine lathe



cross slide. Practically any cylindrical work within the capacity of the lathe may be superfinished. Attachments also have been successfully applied on reamer and work.

## Double-Action Press

■ The Hydraulic Press Mfg. Co., Mount Gilead, O., has a standard hydraulic Fastraverse double action press with dual working pressures and speed, virtually two presses in a frame, was designed for shearing and drawing of large products. Slide contacts uprights at ei



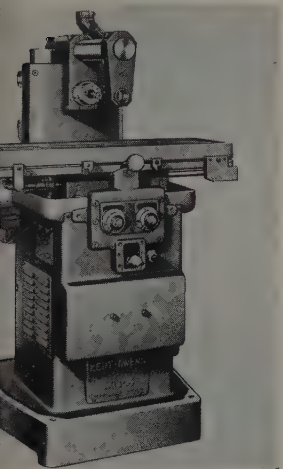
ferent points instead of usual and is actuated by three main shafts. For lighter work only center may be used with faster action under load. Selector valve changeover. Reversal is fast and shockless. Die cushion slide press bed is gib guided and maintains working pressure from pressure operating system. All piping, linkage and operating station built into press frame.

## Hydraulic Miller

■ Kent-Owens Machine Co., O., has developed milling machine with head mounted on two vertical ground steel posts with positioned midway between. There is no overhang of head



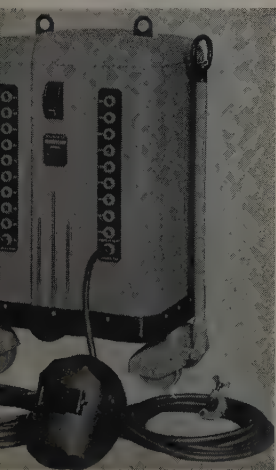
ly chatter-proof for either of table feed. Main drive to as only two gear contacts motor and cutter. One of a pair of pick-off gears provides a range of spindle from 100 to 1335 revolutions per minute or 150 to 2000 revolutions per minute. Dials provide any from 1/2 to 80 inches per cross movement is obtained which has 2 1/2-inch adjustment can be moved vertically from 8 inches from table line of spindle. Coolant cast in base with opening for flushing. No. 1-14



Illustrated has 14-inch table x 9-inch table with three and full automatic cycle. can be fed or rapid traversed in direction and automatically at both ends of stroke and stopped at any desired point level. Almost any desired can be obtained.

## rc Welder

ette Mfg. Co., 409 Johnson neapolis, has developed a alternating-current welder age from 30 to 350 amperes



inclusive and a separate tap for each of the 19 heat stages. Amperage is marked beside each tap. There are no moving parts to wear out. Transformer will operate at full capacity continuously and deliver strong stable arc at any heat stage. Unit is listed under re-examination service of Underwriters' Laboratories Inc.

## Polishes Alloy Steels

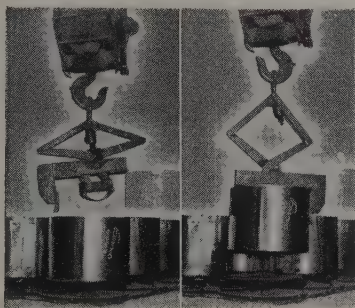
■ Mattison Machine Works, Rockford, Ill., offers No. 455 wide belt sheet grinding and polishing ma-



chine for stainless steel and alloy sheets. Designed to get highest efficiency and longest life from factory-coated abrasives, unit adapts itself for quick application of belts. Belt is automatically controlled and oscillated on rolls. Push button stations and controls for tables are located at front of machine for easy access. Contact rolls are removable and rolls of any degree of cushion may be easily substituted. Units are built to carry belts up to 40 or 50 inches wide, processing sheets up to 36 or 48 inches wide and 10, 12 and 14 feet long.

## Tongs For Strip Coil

■ Heppenstall Co., Hatfield street, Pittsburgh, has designed lightweight tongs for handling strip coils



without damaging edges of thin steel strip. When tong is lowered and comes in contact with coil, release mechanism operates and jaws grip coil as tong is raised. When coil is deposited, tongs automatically release and lock in open position. Mechanical grip is not dependent on power supply. Variation of this design permits handling pairs of coils in same manner.

## Trolley Spot Welder

■ The Electric Arc Cutting & Welding Co., 152 Jelliff avenue, Newark, N. J., offers spot welder with weld-



ing head control and automatic switch in complete compact unit arranged to be hung from trolley or portable crane to handle work clamped to jig or not practical to move. Unit is as portable as a machine with leads but has power demand of between 5 and 10 horsepower instead of 50 to 100 as required by cable type.

## Descaling Apparatus

■ Air Reduction Sales Co., 60 East Forty-Second street, New York, has developed oxyacetylene descaling apparatus to remove scale and other similar accumulations from iron



and steel by rapidly heating deposits with multiframe tips, thereby causing scale to crack off as result of differential expansion between scale and base metal. Apparatus may be mounted on wheeled carriages for ease in travel across steel surfaces. In painting unit drives out occluded moisture from beneath scale of structural steel and plate by rapidly heating the surface, leaving a warmed surface for painting. Immediately after flame application, surface is wirebrushed and swept clean of loosened scale particles and dust. Painting should follow before recondensation of moisture.

## Universal Headstock

■ Landis Tool Co., Waynesboro, Pa., supplies with all hydraulic grinders a universal headstock with either alternating or direct current electric controls. Motor is started and stopped by work and traverse start and stop lever convenient to operator regardless of position of work table. Power is transmitted from motor directly to spindle by multiple V-belts, with no chains or gears. Speed ratio is never less than 6 to 1

and on some sizes as much as 12 to 1. Spindle may be made either live or dead by convenient plunger. Spindle nose is American standard type A-2. Headstock is graduated and may be swiveled 90 degrees on base for face grinding. Dynamic braking stops work positively and automatically.

## Tank Heaters

■ Heil & Co., 3088 West 106th street, Cleveland, announces No cordal steam coil, steam jet and electric immersion tank heaters made of a non-metallic impervious carbon material with heat transfer properties and

maximum resistance to chemical attack. Heaters are recommended for use in muriatic acid, stainless steel, pickle, hydrofluoric acid, ferric chloride, etc. Steam coils withstand a pressure of 50 pounds per square inch. Lengths up to 6 feet are standard. Pipe outside diameter is 2 inches and larger.

## Linestarters

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has a new de-ion combination linestarter, consisting of a magnetically-operated linestarter and a manually-operated motor-circuit switch combined. One

padlock locks unit in "off" position and locks door. Door can be opened with switch in "on" position. Starter is fuseless.

## Spark-Arresting Snubbers

■ Burgess Battery Co., Acouvision, 500 West Huron street, Chicago, has developed SDHS spark-arresting type exhaust snubbers to trap flying particles from vent exhaust noise on Diesels. Unit snubs slugs of high velocity exhaust gas in exhaust and bleeds them to low pressure before any noise can be created by venting building up line surge peak back pressures which cause high fuel consumption. Because of large cross sectional path, velocity of gases is very low and particles tend to separate by gravity. Exhaust gases change direction and velocity so that



*"Take it where it's hottest"*

**Perkins Man Coolers** create refreshing re-circulation of air without chilling drafts.

**Perkins Man Coolers** help to maintain production schedules in the hottest places.

**Perkins Man Coolers** decrease labor turnover and help to make contented workers.

**PERKINS MAN COOLERS ARE MADE IN OSCILLATING AND STATIONARY TYPES, BOTH PORTABLE.**

**B. F. PERKINS & SON, INC., HOLYOKE, MASS.**  
Engineers and Manufacturers

# PERKINS MAN COOLERS

TRADE MARK REG. U.S. PAT. OFF.



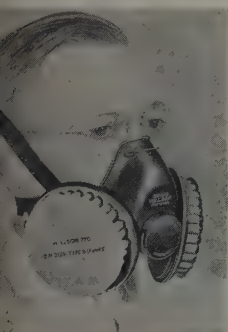
ing finer carbon particles are blown out by centrifugal action. Ash and dust drop into chamber below and are removed through hand hole. Does not require tuning up. Can be installed vertically in any pipe system. Nineteen sizes with connections ranging from 2 to 30 inches in diameter available.

## Metal-Fume Respirators

■ Willson Products, Inc., Easton, Pa., is putting on the market a new B mechanical-filter respirator proved by bureau of mines "protection against fumes of metals as lead, mercury (except vapor), manganese, magnesium, antimony, arsenic, chromium, iron, cadmium and others resulting from sublimation and condensation of their vapor, chemical reactions between vapors and gases." Rubber face of respirator fits snugly under chin and air-tight contact is obtained.



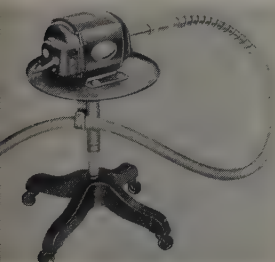
ht tension on adjustable  
lastic headband. Exhalation  
ir through a properly placed



valve is aided by twin in-  
valves in mask interior. Fil-  
y be readily cleaned. All  
economically replaceable.

## le-Shaft Tools

Mfg. Co. Inc., Binghamton,  
nounces a low-priced line  
le-shaft tools for grinding,  
buffing, wire-brushing,  
etc., to be known as the  
unior. Pedestal-type Stow  
ustrated incorporates mo-  
nsion cord and plug, flex-  
t and clamp spindle. Mount-  
4-leg base with ball-bearing  
unit is stable and easily



about. Pedestal is adjust-  
height and carries tool tray.  
izes are  $\frac{1}{4}$ ,  $\frac{1}{3}$ , and  $\frac{1}{2}$   
ver with speeds of 1725 or  
olutions per minute. The  
power tool has a  $\frac{3}{8}$ -inch  
shaft 5 feet long, a wheel  
of 4 inches in diameter and  
side and a drilling capacity  
n.

## ost Welder

Harnischfeger Corp., 4400  
ational avenue, Milwaukee,  
es P & H-Hansen model  
square frame welder for  
service. Occupying less  
square feet of floor space,  
welding range from 40 to  
eres. Automatic volt am-  
ulation, self-excitation and  
stabilization of welding cur-  
incorporated. Unit consists  
piece frame and rotating  
which is statically and dy-  
y balanced. Spring-mounted

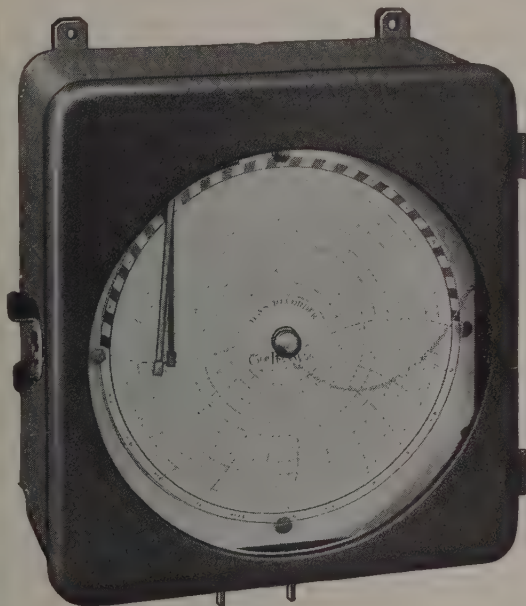


louvres can be snapped on and off  
for inspection of brushes and com-

mutator. Units may be placed in  
parallel without special adjustments  
to increase welding amperage.

## Portable Sludge Pump

Chicago Pneumatic Tool Co., 6  
East 44th street, New York has built  
a portable air-operated sludge pump  
type 7 working on the ejector prin-  
ciple and giving a pulsating flow  
much the same as a hand-pump.  
Unit has high lift capacity and low  
air consumption. It will handle to  
15 per cent of solids and also water  
containing sand or rock drill cut-  
tings.



Two draft values,  
two pressure values,  
two differential val-  
ues, or a combination  
of any two of these  
three values may be  
recorded. Hays Draft  
Recorders are sensi-  
tive enough to register  
accurately increments  
of .0025 inches water  
yet are built husky  
enough to withstand  
the jars and dirt of  
steel mill operations.

# ACCURATE RECORDING OF

## DRAFT, PRESSURE, DIFFERENTIAL

The open hearth furnace is a very leaky structure at best. Therefore, draft conditions within the furnace are apt to be variable. The only way to prevent large leakage of gases is to maintain balanced draft conditions in the hearth.

The Hays Series OT Supersensitive Draft Recorders keep an accurate record of draft, pressure or differential—knowledge very essential to effective furnace operation. By connecting the instrument with the risers from the checker chambers to the furnace at a point just above the level of the charging floor a permanent record is made of pressures and drafts at these points. Balanced conditions on each end can be readily obtained and the amount of this draft is an indication of the draft on the bath.

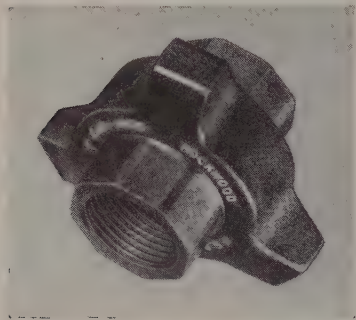
For further details  
Write to  
960 Eighth Ave.



MICHIGAN CITY, INDIANA, U.S.A.

# NEW METAL PRODUCTS

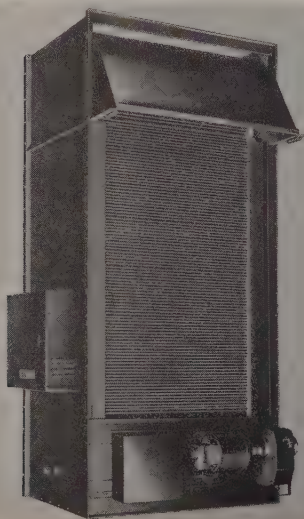
■ Dualsteel hammer lug unions with triple lug nut provide greater convenience in making up and breaking unions apart. Unions, made by Rockwood Sprinkler Co., Worcester, Mass., are ideal for use in processing lines in industrial plants where unions must be broken quickly and often by operators who



are not equipped with regular pipe fitters wrenches. Dualsteel offers resistance to galling and its high graphite content eliminates sticking and freezing to pipe line. Unions are completely parkerized, including all threaded areas.

■ An air filter known as Electro-Matic, which combines electrical precipitation with automatic air filtration to give advantages of both methods of cleaning air has been developed by American Air Filter Co., Inc., Louisville, Ky.

Filter has a front curtain which acts as a precleaner to remove heavier dust particles or scraps of material which might short-circuit



ionizer in rear curtain. Fine dust and smoke particles which escape front curtain pass through ionizing unit in center of filter where they

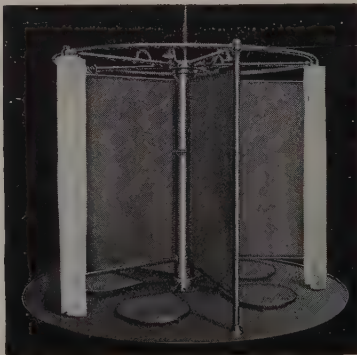
are electrically charged. Entering electrostatic field of rear curtain, ionized dust particles are attracted to charge plates. They are held securely in oil film on plates until removed in oil bath. Casing of filter is thoroughly grounded and is made in standard sections of heights from 5 to 13 feet.

■ Recently placed on the market by South Bend Air Products, Inc., South Bend, Ind., is a heavy-duty fan adapted to man cooling service in large plants. Fan features unbreakable forged aluminum alloy blades, each pair of blades being one continuous forging. Blade design provides uniform air velocity across entire blade area. Safety guard attached with heavy steel strap supports provides rim mesh



of ½-inch expanded metal at sides and 2-inch square mesh for front and rear guard faces. Unit is available in capacities from 3000 to 26,500 cubic feet per minute.

■ Group showers having foot-treadle control which automatically turns water off and on have been developed by Bradley Washfountain Co., North Twenty-second and West Michigan streets, Milwaukee. Pre-tempered water only is used which assures complete safety and reduces water consumption which occurs



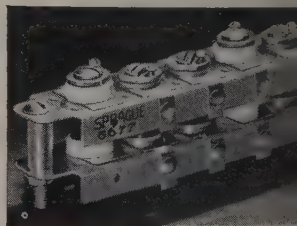
during temperature adjustment. Showers are available without partitions, in circular or semi-circular, 3 or 5 person

■ A refrigerator for keeping foods has been designed by Globe-Worthington Corp., Cincinnati. Four new models are available, two regular and two deluxe in 6 and 7½ cubic foot



capacities. Refrigerator has separate compartment for storage of frozen foods, fish, meat, game and cream. Sub-freezing chamber has large door which is hinged at bottom, forming handy shelf support at both ends by heavy ball bearings. Total shelf area of 7½ cubic foot deluxe model is 15.4 square

■ A two-deck, 5-gang condenser trimmer strip, adjustable by single screw has been announced by Sprague Specialties Co., Adams, Mass. Two-deck strip



facilitate tuning and make possible use of pushbutton tuning in circuit receivers. Strip is protected from drift when subjected to

■ Steel flush type sectional cases which can be easily and securely intermembered have been added to the line of Globe-Worthington Co., Cincinnati. Interlocking at back fits into slot at bottom case on top. When not used, locking angle flange is flush with surface of case. A hole is provided at front for bolting cases together. Cases are made in letter, cabinet and check sizes. Closeouts are available.



# Steady Pace Holds In Steel Markets

## Changes In Demand Not Significant; Ingot Output Expands

Demand generally is following a sidewise trend. Occasional gains are appearing, but total volume shows no significant change.

Production advanced 2 points last week to 54½ per cent. This is the highest rate since late March when it was 28 per cent a year ago. The upturn is not general, being confined largely to the Wheeling and Youngstown districts.

Producers are taking further steps toward correcting irregularities which have prevailed in varying degrees for several months. An attempt will be made to bring official prices through withdrawal of all quotations below these levels. Galvanized sheets and wire products, subject to concessions for some items, are among the principal commodities at which this action is aimed.

The maintenance of a relatively stable market for all products would come too late to repair much of the damage already incurred by the industry's earnings decline for the year as a whole. Heavy sales of sheets and extremely low prices a few weeks ago constitute the major drain on profits. The move to bring current quotations is seen as a necessary step toward the seeking of more remunerative figures for a future date.

### Looking To Be Well Dressed Next 60 Days

It is that fairly steady steelmaking is indicated for the next two months, the outlook remains somewhat indefinite. The automotive industry, still operating at a relatively high rate, shortly will require less production. Plants start to close for the annual model changeover period. Meanwhile small releases for manufacture of new model parts are increasing slowly and are expected to expand next quarter.

Continued shipments of heavy products for building and engineering construction are in prospect for several more months. The railroad outlook holds little promise of large steel orders soon, but developments in traffic, earnings and federal legislation give a more favorable aspect to equipment buy-out possibilities later in the year. Shipbuilding and aircraft production will continue to take moderate quantities.

## MARKET IN TABLOID ★

### *Demand*

*Trend generally sidewise despite some small gains.*

### *Prices*

*Low quotations withdrawn on several products.*

### *Production*

*Advanced 2 points to 54½ per cent.*

Tin plate remains one of the major steel outlets, but is more likely to contract than expand in coming weeks.

Operations of some farm equipment plants have been curtailed lately, but higher schedules are indicated after July 4.

Automobile assemblies spurted unexpectedly last week to a total of 81,070 units. A gain of nearly 3000, this is the largest output in two months and almost double the production a year ago. Ford accounted for the upturn with 19,700 units against 15,500 the week before. General Motors declined from 31,910 to 30,160, Chrysler from 22,900 to 22,650 and all others increased from 7995 to 8560.

### Large Lots Included In Structural, Bar Orders

Several large construction projects help to bolster the fairly numerous small orders for structural shapes and concrete reinforcing bars. Among recent awards are 9000 tons of bars for a federal office building, Washington, and 4200 tons of shapes for a Chicago school. Pending business in steel pipe includes 9000 tons for Harrisburg, Pa.

Orders and inquiries for railroad equipment and track material continue small. Missouri-Illinois has ordered 150 freight cars, and a few units still are pending for other roads.

While most of the impetus behind the recent spurt in steelmaking appears to have spent itself, a belated rise of 7 points to 47 per cent at Pittsburgh last week again headed the national average upward. Wheeling rose 6 points to 79 per cent, Youngstown rose 2 points to 54 and eastern Pennsylvania was up 1 to 38.

Chicago held at 49½ per cent and Cleveland was steady at 55½. Other unchanged districts were Birmingham at 71, St. Louis at 42 and Detroit at 57. Buffalo declined 4½ points to 39½, New England slumped 8 points to 32 and Cincinnati was off 13 points to 60.

Scrap markets also have quieted, following several weeks of rising prices and heavier demand. Quotations generally are steady, however, and the composite holds at \$14.62. The finished steel composite is unchanged at \$55.70.

# COMPOSITE MARKET AVERAGES

	June 24	June 17	June 10	One Month Ago May, 1939	Three Months Ago March, 1939	One Year Ago June, 1938
Iron and Steel ....	\$35.72	\$35.71	\$35.72	\$35.80	\$36.40	\$38.41
Finished Steel ....	55.70	55.70	55.70	56.00	56.50	61.55
Steelworks Scrap..	14.62	14.62	14.62	14.05	14.98	10.89

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

## COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year

Finished Material	June 24, 1939	May 1939	March 1939	June 1938	Pig Iron	June 24, 1939	May 1939	March 1939
Steel bars, Pittsburgh .....	2.15c	2.20c	2.25c	2.45c	Bessemer, del. Pittsburgh .....	\$22.34	\$22.34	\$22.34
Steel bars, Chicago .....	2.15	2.20	2.25	2.40	Basic, Valley .....	20.50	20.50	20.50
Steel bars, Philadelphia .....	2.47	2.52	2.57	2.47	Basic, eastern, del. Philadelphia .....	22.34	22.34	22.34
Iron bars, Terre Haute, Ind. ....	2.05	2.10	2.15	2.35	No. 2 foundry, Pittsburgh .....	22.21	22.21	22.21
Shapes, Pittsburgh .....	2.10	2.10	2.10	2.25	No. 2 foundry, Chicago .....	21.00	21.00	21.00
Shapes, Philadelphia .....	2.215	2.21 1/2	2.21 1/2	2.40 1/2	Southern No. 2, Birmingham .....	17.38	17.38	17.38
Shapes, Chicago .....	2.10	2.10	2.10	2.25	Southern No. 2, del. Cincinnati .....	20.89	20.89	20.89
Plates, Pittsburgh .....	2.10	2.10	2.10	2.25	No. 2X, del. Phila. (differ. av.) ..	23.215	23.215	23.215
Plates, Philadelphia .....	2.15	2.15	2.15	2.371	Malleable, Valley .....	21.00	21.00	21.00
Plates, Chicago .....	2.10	2.10	2.10	2.25	Malleable, Chicago .....	21.00	21.00	21.00
Sheets, hot-rolled, Pittsburgh .....	2.00	2.05	2.15	2.40	Lake Sup., charcoal, del. Chicago .....	28.34	28.34	28.34
Sheets, cold-rolled, Pittsburgh .....	3.05	3.10	3.20	3.45	Gray forge, del. Pittsburgh .....	21.17	21.17	21.17
Sheets, No. 24 galv., Pittsburgh .....	3.50	3.50	3.50	3.75	Ferromanganese, del. Pittsburgh .....	85.33	85.33	85.27
Sheets, hot-rolled, Gary .....	2.00	2.03	2.15	2.40				
Sheets, cold-rolled, Gary .....	3.05	3.08	3.20	3.20				
Sheets, No. 24 galv., Gary .....	3.50	3.50	3.50	3.80				
Bright bess., basic wire, Pitts. ....	2.60	2.60	2.60	2.90				
Tin plate, per base box, Pitts. ....	\$5.00	\$5.00	\$5.00	\$5.35				
Wire nails, Pittsburgh .....	2.45	2.45	2.45	2.75				

### Semifinished Material

Sheet bars, Pittsburgh, Chicago ..	\$34.00	\$34.00	\$34.00	\$37.00
Slabs, Pittsburgh, Chicago .....	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh .....	34.00	34.00	34.00	37.00
Wire rods, No. 5 to 3/4-inch, Pitts. ..	43.00	43.00	43.00	47.00

### Scrap

Heavy melting steel, Pittsburgh ..	\$15.25	\$14.55	\$15.75
Heavy melt. steel, No. 2, E. Pa. ....	13.25	12.75	13.40
Heavy melting steel, Chicago .....	13.50	12.75	14.25
Rails for rolling, Chicago .....	17.75	17.25	17.25
Railroad steel specialties, Chicago ..	15.50	14.75	16.25

### Coke

Connellsville, furnace, ovens .....	\$3.75	\$3.75	\$3.75
Connellsville, foundry, ovens .....	5.00	5.00	5.00
Chicago, by-product fdry., del. ....	10.50	10.50	10.50

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

*Except when otherwise designated, prices are base, f.o.b. cars.*

### Sheet Steel

#### Hot Rolled

Pittsburgh .....	2.00c
Chicago, Gary .....	2.00c
Cleveland .....	2.00c
Detroit, del. ....	2.00c
Buffalo .....	2.00c
Sparrows Point, Md. ....	2.00c
New York, del. ....	2.24c
Philadelphia, del. ....	2.17c
Granite City, Ill. ....	2.10c
Middletown, O. ....	2.00c
Youngstown, O. ....	2.00c
Birmingham .....	2.00c
Pacific Coast points .....	2.50c

#### Cold Rolled

Pittsburgh .....	3.05c
Chicago, Gary .....	3.05c
Buffalo .....	3.05c
Cleveland .....	3.05c
Detroit, delivered .....	3.15c
Philadelphia, del. ....	3.37c
New York, del. ....	3.39c
Granite City, Ill. ....	3.15c
Middletown, O. ....	3.05c
Youngstown, O. ....	3.05c
Pacific Coast points .....	3.65c

#### Galvanized No. 24

Pittsburgh .....	3.50c
Chicago, Gary .....	3.50c
Buffalo .....	3.50c
Sparrows Point, Md. ....	3.50c
Philadelphia, del. ....	3.67c
New York, delivered .....	3.74c
Birmingham .....	3.50c

Granite City, Ill. ....	3.60c
Middletown, O. ....	3.50c
Youngstown, O. ....	3.50c
Pacific Coast points .....	4.00c

<b>Black Plate, No. 29 and Lighter</b>	
Pittsburgh .....	3.05c
Chicago, Gary .....	3.05c
Granite City, Ill. ....	3.15c

<b>Long Ternes No. 24 Unassorted</b>	
Pittsburgh, Gary .....	3.80c
Pacific Coast .....	4.50c

#### Enameling Sheets

	No. 10	No. 20
Pittsburgh .....	2.75c	3.35c
Chicago, Gary .....	2.75c	3.35c
Granite City, Ill. ....	2.85c	3.45c
Youngstown, O. ....	2.75c	3.35c
Cleveland .....	2.75c	3.35c
Middletown, O. ....	2.75c	3.35c
Pacific Coast .....	3.35c	3.95c

### Corrosion and Heat-Resistant Alloys

*Pittsburgh base, cents per lb.*

#### Chrome-Nickel

	No. 302	No. 304
Bars .....	24.00	25.00
Plates .....	27.00	29.00
Sheets .....	34.00	36.00
Hot strip .....	21.50	23.50
Cold strip .....	28.00	30.00

#### Straight Chromes

	No.	No.	No.	No.
Bars .....	410	430	442	446
	18.50	19.00	22.50	27.50

Plates ..	21.50	22.00	25.50	30.50
Sheets ..	26.50	29.00	32.50	36.50
Hot strip ..	17.00	17.50	24.00	35.00
Cold stp. ....	22.00	22.50	32.00	52.00

### Steel Plate

Pittsburgh .....	2.10c
New York, del. ....	2.19-2.29c
Philadelphia, del. ....	2.15c
Boston, delivered .....	2.42c
Buffalo, delivered .....	2.33c
Chicago or Gary .....	2.10c
Cleveland .....	2.10c
Birmingham .....	2.10c
Coatesville, base .....	2.10c
Sparrows Point, base .....	2.10c
Claymont, del. ....	2.10c
Youngstown .....	2.10c
Gulf ports .....	2.45c
Pacific Coast points .....	2.60c

#### Steel Floor Plates

Chicago .....	3.35c
Gulf ports .....	3.70c
Pacific Coast ports .....	3.95c
Pittsburgh .....	3.35c

### Standard Shapes

Pittsburgh .....	2.10c
Philadelphia, del. ....	2.21 1/2c
New York, del. ....	2.27c
Boston, delivered .....	2.41c
Bethlehem .....	2.10c
Chicago .....	2.10c
Cleveland, del. ....	2.30c

### Tin and Terne Plate

#### Tin Plate, Coke (base)

Pittsburgh, Gary, Chicago .....	
Granite City, Ill. ....	
<b>Mfg. Terne Plate (base)</b>	
Pittsburgh, Gary, Chicago .....	
Granite City, Ill. ....	

### Bars

#### Soft Steel

	(Base, 3 tons or over)
Pittsburgh .....	
Chicago or Gary .....	
Duluth .....	
Birmingham .....	
Cleveland .....	
Buffalo .....	
Detroit, delivered .....	
Philadelphia, del. ....	
Boston, delivered .....	
New York, del. ....	
Gulf ports .....	
Pacific Coast points .....	

#### Rail Steel

	(Base, 15 tons or over)
Pittsburgh .....	
Chicago or Gary .....	
Detroit, delivered .....	
Cleveland .....	



# —The Market Week—

.....	2.00c
am.....	2.00c
ts.....	2.35c
oast points.....	2.60c
<b>Iron</b>	
Terre Haute.....	2.05c
hia.....	2.37c
h, refined.....	3.50-8.00c
<b>Reinforcing</b>	
let, straight lengths, ed by distributors	
Gary, Buffalo	
Birm., Young,	
ws Pt., Pitts., 1.80-2.05c	
delivered.....	1.90-2.15c
s.....	2.20-2.40c
ast ports.....	2.50c
hia, del.....	1.97-2.22c
eel, straight lengths, ed by distributors	
h, Gary, Chi-	
Buffalo, Cleve-	
Birm.....	1.75-1.90c
delivered.....	1.85-2.00c
s.....	2.10-2.25c
ast.....	2.35c

## Products

ve-Chicago-Birm. base	
lb. keg in carloads	
wire nails.....	\$2.45
oated nails.....	\$2.45
(Per pound)	
staples.....	3.15c
ce staples.....	3.40c
bed wire, stand-	
2½ gage two-	
ool, 80-rod spool	
wo-point cattle,	
spool.....	\$2.62
fence wire.....	2.95c
ce wire.....	3.35c
encing (base	
olumn).....	67.00
oop bale ties,	
C. L. column).....	56.00
<b>Manufacturing Trade</b>	
ts, Cleve. - Chicago-	
ham, (except spring	
wire).....	
ss., basic wire.....	2.60c
ed wire.....	2.65c
ire.....	3.20c
r, Mass., \$2 higher on	
basic and spring wire.	

## Nails

Pittsburgh.....	\$3.60
-----------------	--------

## Finished Bars

	Carbon	Alloy
h.....	2.65c	3.35c
.....	2.65c	3.35c
.....	2.65c	3.35c
.....	2.70c	*3.45c
.....	2.65c	3.35c
red.....	2.65c	3.35c

## Bars (Hot)

e, 3 tons or over)	
h, Buffalo, Chi-	
Massillon, Can-	
stliehem.....	2.70c
delivered.....	2.80c
Alloy	
Diff. S.A.E. Diff.	
0.35 3100.....	0.70
0.75 3200.....	1.35
1.55 3300.....	3.80
2.25 3400.....	3.20
to 0.25 Mo.....	0.55
to 0.30 Mo. 1.50-	
.....	1.10
1.10 Cr.....	0.45
spring flats.....	0.15
s.....	1.20
ing flats.....	0.85
an.....	1.50
an.....	0.85
ing flats.....	0.15
ng rounds, squares	0.40
c furnace up 50 cents.	

## Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

### Hot Strip, 12-inch and less

Pittsburgh, Chicago,	
Gary, Cleveland,	
Youngstown, Middle-	
town, Birmingham....	2.00c
Detroit, del.....	2.10c
Philadelphia, del.....	2.32c
New York, del.....	2.36c
Cooperage hoop, Youngs.,	
Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon	
and under, Pittsburgh,	
Cleveland, Youngstown	2.80c
Chicago.....	2.90c
Detroit, del.....	2.90c
Worcester, Mass.....	3.00c
Carbon.....	
0.26—0.50.....	2.80c
0.51—0.75.....	4.30c
0.76—1.00.....	6.15c
Over 1.00.....	8.35c
Worcester, Mass \$4 higher.	

### Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.....	3.05c
Worcester, Mass.....	3.35c
Lamp stock up 10 cents.	

## Rails, Fastenings

(Gross Tons)

Standard rails, mill.....	\$40.00
Relay rails, Pittsburgh	
20—100 lbs.....	\$2.50-35.50
Light rails, billet qual.,	
Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality.....	39.00

Cents per pound

Angle bars, billet, mills.	2.70c
Do., axle steel.....	2.85c
Spikes, R. R., base.....	3.00c
Track bolts, base.....	4.15c
Car axles forged, Pitts.,	
Chicago, Birmingham.....	3.15c
Tie plates, base.....	2.15c
Base, light rails 25 to 60 lbs.,	
20 lbs., up \$2; 16 lbs., up \$4; 12	
lbs., up \$8; 8 lbs., up \$10. Base	
railroad spikes 200 kegs or	
more; base plates 20 tons.	

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932. Lists, carloads 5% up; full containers additional 10%.

### Carriage and Machine

½ x 6 and smaller.....	68.5 off
Do. larger, to 1-in.....	66 off
Do. 1½ and larger.....	64 off
Tire bolts.....	52.5 off

### Stove Bolts

In packages with nuts attached	
72.5 off; in packages with	
nuts separate 72.5-12½ off;	
bulk 84 off on 15,000 of 3-inch	
and shorter, or 5000 over 3-in.	
Step bolts.....	60 off
Elevator bolts.....	60 off
Plow bolts.....	68.5 off

### Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less.....	67	70
¾-1-inch.....	64	65
1½ and larger.....	62	62

### Hexagon Cap Screws

Upset, 1-in., smaller.....	67.5 off
Square Head Set Screws	
Upset, 1-in., smaller.....	75.0 off
Headless set screws.....	70.0 off

## Piling

Pitts., Chgo., Buffalo....	2.40c
Gulf ports.....	2.75c

## Rivets, Washers

Structural, Pittsburgh,	
Cleveland, Chicago....	3.40c
¾-inch and smaller,	

11 and 12.....	63½	54
Pitts., Chi., Cleve.....	65-10 off	
Wrought washers, Pitts.,		
Chi., Phila., to jobbers		
and large nut, bolt		
mfrs. l.c.l. \$5.40; c.l. \$5.75 off		

## Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

### Butt Weld Steel

In.	Blk.	Galv.
¾.....	63½	54
1.....	66½	58
1-3.....	68½	60½

### Iron

¾.....	30	13
1-1½.....	34	19
1½.....	38	21½
2.....	37½	21

### Lap Weld Steel

2.....	61	52½
2½-3.....	64	55½
3½-6.....	66	57½
7 and 8.....	65	55½
9 and 10.....	64½	55

### Iron

2.....	30½	15
2½-3½.....	31½	17½
4.....	33½	21
4½-8.....	32½	20
9-12.....	28½	15

### Line Pipe Steel

1 to 3, butt weld.....	67½
2, lap weld.....	60
2½ to 3, lap weld.....	63
3½ to 6, lap weld.....	65
7 and 8, lap weld.....	64
10-inch lap weld.....	63½
12-inch, lap weld.....	62½

### Iron

¾ butt weld.....	Blk.	Galv.
1 and 1½ butt weld.....	25	7
1½ butt weld.....	29	13
2 butt weld.....	33	15½
1½ lap weld.....	32½	15
2 lap weld.....	23½	7
2½ lap weld.....	25½	9
2½ to 3½ lap weld.....	26½	11½
4 lap weld.....	28½	15
4½ to 8 lap weld.....	27½	14
9 to 12 lap weld.....	23½	9

## Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

### Lap Welded

Sizes	Gage	Hot Rolled	Charcoal Iron
1½" O.D. 13	\$ 9.72	\$23.71	
1¾" O.D. 13	11.06	22.93	
2" O.D. 13	12.38	19.35	
2¼" O.D. 13	13.79	21.68	
2½" O.D. 12	15.16	.....	
2¾" O.D. 12	16.58	26.57	
3" O.D. 12	17.54	29.00	
3½" O.D. 11	18.35	31.36	
4" O.D. 10	23.15	39.81	
5" O.D. 9	28.66	49.90	
6" O.D. 7	44.25	73.93	
.....	68.14	.....	

### Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D. 13	\$ 7.82	\$ 9.01	
1¼" O.D. 13	9.26	10.67	
1½" O.D. 13	10.23	11.79	
1¾" O.D. 13	11.64	13.42	

2" O.D. 13	13.04	15.03
2½" O.D. 13	14.54	16.76
2¾" O.D. 12	16.01	18.45
2½" O.D. 12	17.54	20.21
2¾" O.D. 12	18.59	21.42
3" O.D. 12	19.50	22.48
3½" O.D. 11	24.62	28.37
4" O.D. 10	30.54	35.20
4½" O.D. 10	37.35	43.04
5" O.D. 9	46.87	54.01
6" O.D. 7	71.96	82.93

## Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm..	\$42.00-43.00
4-in., Birmingham..	45.00-46.00
4-in., Chicago.....	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.....	49.00
Class A Pipe \$3 over Class B	
Std. ftgs., Birm., base	\$100.00

## Semifinished Steel

### Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary,	
Cleve., Buffalo, Young,	
Birm., Sparrows Point..	\$34.00
Duluth (billets).....	36.00
Detroit, delivered.....	36.00

### Forging Quality Billets

Pitts., Chi., Gary, Cleve.,	
Young., Buffalo, Birm..	40.00
Duluth.....	42.00

### Sheet Bars

Pitts., Cleveland, Young.,	
Sparrows Point, Buf-	
falo, Canton, Chicago..	34.00
Detroit, delivered.....	38.00

### Wire Rods

Pitts., Cleveland, Chicago,	
Birmingham No. 5 to ¾-	
inch incl.....	43.00
Do. over ¾ to 1½-in. incl.	48.00
Worcester up \$2; Galveston	
up \$6; Pacific Coast up \$9.	

### Skelp

Pitts., Chi., Young., Buff.,	
Coatesville, Sparrows Pt.	1.90c

## Coke

Price Per Net Ton

<b>Beehive Ovens</b>	
Connellsville, fur.....	\$3.75
Connellsville, fdry.....	4.75- 5.50
Connell. prem. fdry.....	5.75- 6.25
New River fdry.....	6.50- 6.75
Wise county fdry.....	5.50- 5.75
Wise county fur.....	4.50- 4.75

### By-Product Foundry

Newark, N. J., del.....	10.88-11.35
Chi., ov., outside del.....	9.75
Chicago, del.....	10.50
Terre Haute, del.....	10.00
Milwaukee, ovens.....	10.50
New England, del.....	12.50
St. Louis, del.....	11.00-11.50
Birmingham, ovens.....	7.00
Indianapolis, del.....	10.00
Cincinnati, del.....	9.75
Cleveland, del.....	10.30
Buffalo, del.....	10.50
Detroit, del.....	10.25
Philadelphia, del.....	10.65

## Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol....	16.00c
Toluol, two degree.....	22.00c
Solvent naphtha.....	26.00c
Industrial xylol.....	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.).....	15.25c
Eastern Plants, per lb.	
Naphthalene flakes, balls,	
blbs. to jobbers.....	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia....	\$28.00

## Pig Iron

Delivered prices include switching charges only as noted.  
No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malle- able	Basic	Besse- mer
Bethlehem, Pa. ....	\$22.00	\$22.50	\$21.50	\$23.00
Birdsboro, Pa. ....	22.00	22.50	21.50	23.00
Birmingham, Ala.† ..	17.38	.....	16.38	22.00
Buffalo .....	21.00	21.50	20.00	22.00
Chicago .....	21.00	21.00	20.50	21.50
Cleveland .....	21.00	21.00	20.50	21.50
Detroit .....	21.00	21.00	20.50	21.50
Duluth .....	21.50	21.50	.....	22.00
Erle, Pa. ....	21.00	21.50	20.50	22.00
Everett, Mass. ....	22.00	22.50	21.50	23.00
Granite City, Ill. ....	21.00	21.00	20.50	21.50
Hamilton, O. ....	21.00	21.00	20.50	.....
Neville Island, Pa. ....	21.00	21.00	20.50	21.50
Provo, Utah .....	19.00	.....	.....	.....
Sharpsville, Pa. ....	21.00	21.00	20.50	21.50
Sparrow's Point, Md. ....	22.00	.....	21.50	.....
Swedeland, Pa. ....	22.00	22.50	21.50	23.00
Toledo, O. ....	21.00	21.00	20.50	21.50
Youngstown, O. ....	21.00	21.00	20.50	21.50

†Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

### Delivered from Basing Points:

Akron, O., from Cleveland.....	22.39	22.39	21.89	22.89
Baltimore from Birmingham.....	22.78	.....	21.66	.....
Boston from Birmingham.....	22.12	.....	.....	.....
Boston from Everett, Mass. ....	22.50	23.00	22.00	23.50
Boston from Buffalo .....	22.50	23.00	22.00	23.50
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland .....	22.39	22.39	21.89	22.89
Chicago from Birmingham .....	†21.22	.....	.....	.....
Cincinnati from Hamilton, O. ....	21.24	22.11	21.61	.....
Cincinnati from Birmingham.....	21.06	.....	20.06	.....
Cleveland from Birmingham.....	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O. ....	22.94	22.94	22.44	22.44
Milwaukee from Chicago .....	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago,	.....	.....	.....	.....
Toledo or Detroit .....	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem ..	23.53	24.03	.....	.....
Philadelphia from Birmingham ..	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville	[Neville base, plus 69c, 84c, and \$1.24 freight.]			
Island .....	.....	.....	.....	.....
Saginaw, Mich., from Detroit....	23.45	23.45	22.95	22.95

No. 2 Malle- Fdry. able Basic			
St. Louis, northern .....	21.50	21.50	21.00
St. Louis from Birmingham.....	†21.12	.....	20.62
St. Paul from Duluth .....	23.63	23.63	.....
†Over 0.70 phos.			

### Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, \$26.50, base; \$27.74 delivered Philadelphia.

### Gray Forge

Valley furnace .....	\$20.50	Lake Superior fur. ....	.....
Pitts. dist. fur. ....	20.50	do., del Chicago .....	.....
		Lyles, Tenn. ....	.....

### †Silvery

Jackson county, O., base: 6-6.50 per cent \$25.50; 6.51-7-7-7.50—\$26.50; 7.51-8—\$27.00; 8-8.50—\$27.50; 8.51-9-9-9.50—\$28.50; Buffalo, \$1.25 higher.

### Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for all plus \$1 a ton.

†The lower all-rail delivered price from Jackson, O., or 1 is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 \$1 per ton add. Each unit over 3%, add \$1 per ton.

## Refractories

Per 1000 f.o.b. Works, Net Prices

### Fire Clay Brick

#### Super Quality

Pa., Mo., Ky. .... \$60.80

#### First Quality

Pa., Ill., Md., Mo., Ky. .... 47.50

Alabama, Georgia..... 47.50

New Jersey ..... 52.50 |

#### Second Quality

Pa., Ill., Ky., Md., Mo. .... 42.75

Georgia, Alabama ..... 34.20 |

New Jersey ..... 49.00 |

#### Ohio

First quality ..... 39.90 |

Intermediate ..... 36.10 |

Second quality ..... 31.35 |

### Malleable Bung Brick

All bases ..... \$56.05 |

### Silica Brick

Pennsylvania ..... \$47.50 |

Joliet, E. Chicago..... 55.10 |

Birmingham, Ala. .... 47.50 |

### Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press ..... \$28.00 |

Wire cut ..... \$26.00 |

### Magnesite

Imported dead - burned

grains, net ton f.o.b.

Chester, Pa., and Bal-

timore bases (bags) ..

Do. domestic .....

Do., f.o.b. Chewelah,

Wash., net ton, bulk ..

net ton, bags .....

Quicksset magnesite

grains, f.o.b. Chewe-

lah, Wash., net, bulk ..

Basic Brick

Net ton, f.o.b. Baltimo-

mouth Meeting, Cheste-

Chrome brick .....

Chem. bonded chrome ..

Magnesite brick .....

Chem. bonded magnesite

Fluorspar, 85-5

Washed gravel, duty

pd., tide, net ton. ....

Washed gravel, f.o.b.

Ill., Ky., net ton .....

carloads, all rail .....

Do. barge .....

No. 2 lump .....

## Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. ....	\$80.00	bon, per lb. contained		carlots, contr. net ton.	\$142.50	contract, carlots, 2	
Do., del. Pittsburgh.....	85.33	chrome .....	16.50c	Do, spot .....	145.00	¼-in., lb. ....	.....
Spiegeleisen, 19-21% dom.		Do., ton lots .....	17.25c	Do, contract, ton lots	145.00	Do, 2% .....	.....
Palmerston, Pa., spot. ....	28.00	Do., less-ton lots .....	17.75c	Do, spot, ton lots....	150.00	Spot ¼c higher	.....
Do., 26-28%, Palmer-		Car- Ton Less		15-18% tl., 3-5% carbon,		Silicon Briquets, contrac	
ton .....	33.00	loads lots ton		carlots, contr., net ton	157.50	carloads freight all	
Ferrosilicon, 50% freight		2% carb. ....	16.50c	Do, spot .....	160.00	lowed, ton .....	
allowed, c.i. ....	69.50	1% carb. ....	17.50c	Do, contract, ton lots.	160.00	Carload, spot .....	
Do., ton lot .....	80.50	0.10% carb. ....	18.50c	Do, spot, ton lots....	165.00	Less-ton lots, lb. ....	
Do., 75 per cent. ....	126.00	0.20% carb. ....	19.50c			Manganese Briquets, contract	
Spot, \$5 a ton higher.		Spot ¼c higher		Alsiifer, contract carlots,		contract carloads	
Silicomane, 2½ carbon. ....	88.00	Ferromolybdenum, 55-		f.o.b. Niagara Falls, lb.	7.50c	bulk freight allowed	
2% carbon, 93.00; 1%, 103.00		65% molyb. cont., f.o.b.		Do, ton lots .....	8.00c	lb. ....	
Contract ton price \$11		mill, lb. ....	0.95	Do, less-ton lots .....	8.50c	Ton lots .....	
higher; spot \$5 over		Calcium molybdate, lb.		Spot ¼c lb. higher		Less-ton lots .....	
contract.		molyb. cont., f.o.b. mill	0.80	Chromium Briquets, con-		Spot ¼c higher	
Ferrotungsten, stand., lb.		Ferrotitanium, 40-45%,		tract, any quantity,		Zirconium Alloy, 12-15%	
con. del. cars .....	1.60-1.65	lb., con. tl., f.o.b. Niag-		freight allowed, lb. ....	7.25c	contract, carloads	
Ferrovanadium, 35 to		ara Falls, ton lots. ....	\$1.23	Do, spot carlots, bulk	7.50c	gross ton .....	
40%, lb., cont. ....	2.70-2.80-2.90	Do., less-ton lots .....	1.25	Do, ton lots .....	8.00c	Do, spot .....	
Ferrophosphorus, gr. ton,		20-25% carbon, 0.10		Do., less-ton lots .....	8.25c	34-40%, contract, car-	
c.i., 17-18% Rockdale,		max., ton lots, lb. ....	1.35	Tungsten Metal Powder,		loads, lb., alloy.....	
Tenn., basis, 18%, \$3		Do, less-ton lots. ....	1.40	according to grade,		Do, ton lots .....	
unitage, 58.50; electro-		Spot 5c higher		spot shipment, 200-lb.		Do, less-ton lots .....	
lytic, per ton, c. l., 23-		Ferrocolumbium, 50-60%,		drum lots, lb. ....	\$2.00	Spot ¼c higher	
26% f.o.b. Monsanto,		contract, lb. con. col.,		Do, smaller lots. ....	2.10	Molybdenum Powder	
Tenn., 24% \$3 unitage	75.00	f.o.b. Niagara Falls. ....	\$2.25	Vanadium Pentoxide,		99%, f.o.b. York, Pa.	
Ferrochrome, 66-70 chro-		Do, less-ton lots .....	2.30	contract, lb. contained	\$1.10	200-lb. kegs, lb. ....	
mium, 4-6 carbon, cts.		Spot is 10c higher		Do, spot .....	1.15	Do, 100-200 lb. lots.	
lb., contained cr., del.		Technical molybdenum		Chromium Metal, 98%		Do, under 100-lb. lot	
carlots .....	10.50c	trioxide, 53 to 60% mo-		cr., 0.50 carbon max.,		Molybdenum Oxide	
Do., ton lots .....	11.25c	lybdenum, lb. molyb.		contract, lb. con.	80.00c	Briquets, 48-52% mo-	
Do., less-ton lots .....	11.50c	cont., f.o.b. mill. ....	0.80	chrome .....	85.00c	lybdenum, per poun	
67-72% carloads, 2% car-		Ferro-carbon-titanium, 15-		Do, spot .....	79.00c	contained, f.o.b. pro-	
		18%, tl., 6-8% carb.,		Silicon Metal, 1% iron,	84.00c	ducers' plant .....	

72



# WAREHOUSE STEEL PRICES

*Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials*

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Struc- tural Shapes	Floor Plates	Hot Rolled	Sheets Cold Rolled	Galv. No. 24
.....	3.88	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.61
.....	3.84	3.96	3.96	3.76	3.75	5.56	3.40	4.60	4.50
.....	3.60	3.60	4.10	3.40	3.40	5.00	3.40	4.06	4.43
.....	3.70	3.80	4.80	3.55	3.55	5.00	3.55	4.90	4.30
.....	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40
.....	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.40
.....	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.50
.....	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62
.....	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59
.....	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57
.....	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.25
.....	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50
.....	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.38
.....	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52
.....	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00
.....	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00
.....	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40
.....	4.54	4.64	4.64	4.41	4.41	6.01	4.32	....	5.29
.....	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85
.....	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
.....	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
.....	3.65	3.85	5.20	3.40	3.50	5.25	3.70	....	4.75
.....	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
.....	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	4.75
.....	3.50	3.90	6.00	3.45	3.45	5.05	3.45	6.40	5.15
SAE Hot-rolled Bars (Unannealed)									
	Cold Rolled Strip	Cold Finished Bars	1035- 1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	3100
.....	3.46	4.13	4.18	7.50	6.05	5.80	7.90	8.63	7.23
.....	3.51	4.09	4.04	7.35	5.90	5.65	....	8.59	7.19
.....	3.66	4.06	3.85	7.31	5.86	5.61	8.56	....	....
.....	....	4.05	3.85	....	....	....	....	....	....
.....	....	4.15	....	....	....	....	....	....	....
.....	3.42	3.75	3.75	7.10	5.65	5.40	8.50	8.15	6.75
.....	3.35	3.65	3.35	7.35	5.95	5.50	7.60	8.35	6.95
.....	3.20	3.75	3.30	7.30	5.85	5.85	7.70	8.15	6.75
.....	3.40	3.80	3.38	7.42	5.97	5.72	7.19	8.45	7.05
.....	3.45	4.00	3.65	7.44	5.99	5.74	8.84	8.50	7.10
.....	3.50	3.75	3.65	7.10	5.65	5.40	7.50	8.15	6.75
.....	....	4.34	3.90	7.45	6.00	8.59	9.19	8.84	7.44
.....	....	3.88	3.78	7.33	5.88	5.63	7.73	8.38	6.98
.....	3.61	4.02	3.82	7.47	6.02	5.77	7.87	8.52	7.12
.....	....	4.30	....	....	....	....	....	....	....
.....	....	4.31	....	....	....	....	....	....	....
.....	....	4.39	....	....	....	....	....	....	....
.....	....	4.79	....	....	....	....	....	....	....
.....	....	4.43	....	....	....	....	....	....	....
.....	5.00	5.10	....	....	....	....	....	....	....
.....	....	5.60	5.65	....	7.80	7.65	8.45	....	....
.....	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
.....	4.45	6.00	4.65	9.40	8.55	8.40	8.05	10.40	8.55
.....	*9.30	6.55	4.50	9.65	8.80	8.65	9.30	10.65	9.80

Based on minimum quantity.

## CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, June 22

Prices f. o. b. Port of Dispatch—

Domestic Prices at Works or Furnace—

By Cable or Radio				Last Reported							
Continental Channel or North Sea ports, gross tons				£ s d	French France	Belgian France	Reich Mark				
British gross tons U. K. ports		Quoted in dollars at current value	**Quoted in gold pounds sterling								
£ s d			£ s d								
50-3.00 Si...	\$23.40	5 0 0	\$18.32	2 3 0	Fdy. pig iron. Si. .25	\$23.17	4 19 0 (a) \$16.61	626.75 \$17.00	500	\$25.28	63
mer.....	2.30c	11 0 0	1.95c to 1.98c	5 2 6 to 5 4 0	Basic bess. pig iron...	21.65	4 12 6 (a)	....	....	27.89 (b)	69.50
Phos. .03-.05	23.57	5 5 0*	17.89	2 2 0	Furnace coke.....	5.38	1 4 2	5.96	225	6.87	202
.....	23.57	5 5 0*	....	....	Billets.....	34.52	7 7 6	25.04	945	29.24	860
.....	334.52	7 7 6	\$38.34	4 10 0	Standard rails.....	1.99c	9 10 0	1.56c	1,300	2.06c	1,375
No. 5 gage..	53.24	11 7 6	42.60	5 0 0	Merchant bars.....	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100
.....	334.52	7 7 6	\$38.34	4 10 0	Structural shapes....	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100
.....	53.24	11 7 6	42.60	5 0 0	Plates, 1¼-in. or 5 mm.....	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375
.....	\$44.46	9 10 0	\$48.99	5 15 0	Sheets, black.....	3.08c	14 15 0‡	2.17c	1,805‡	2.36c	1,575‡
.....	2.30c	11 0 0	1.95c to 1.98c	5 2 6 to 5 4 0	Sheets, galv., corr., 24 ga. or 0.5 mm.....	3.61c	17 5 0	3.30c	2,750	4.13c	2,750
.....	2.09c	10 0 0	1.76c to 1.85c	4 12 6 to 4 17 6	Plain wire.....	4.08c	19 10 0	1.74c	1,450	2.48c	1,650
.....	2.09c	10 18 9	2.14c to 2.35c	5 12 6 to 6 2 6	Bands and strips....	2.58c	12 7 0††	1.61c	1,340	1.95c	1,300
.....	2.72c	13 0 0	2.95c	7 15 0°	*Basic. †British ship-plates. Continental, bridge plates. ‡24 ga. †1 to 3 mm. basic price.						
.....	3.29c	15 15 0	3.52c	9 5 0	British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel.						
.....	2.77c	13 5 0	2.00c to 2.04c	5 5 0 to 5 7 6	(a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.						
.....	4.08c	19 10 0	2.33c to 2.76c	6 2 6 to 7 5 0	††Rebate of 15s on certain conditions.						
.....	4.86c	23 5 0	2.99c to 3.09c	7 17 6 to 8 2 6	**Gold pound sterling carries a premium of 75 per cent over paper sterling.						
.....	....	....	2.66c to 2.85c	7 0 0 to 7 10 0							
No. 108 lbs.	\$ 4.74	1 0 3	....	....							
Manganese \$80.00 delivered Atlantic seaboard duty-paid.											

# IRON AND STEEL SCRAP PRICES

*Corrected to Friday night. Crossrons delivered to consumers, except where otherwise stated; † indicates brokers prices*

## HEAVY MELTING STEEL

Birmingham, No. 1	12.00
Bos. dock No. 1 exp.	13.75-14.00
New Eng. del. No. 1	14.00
Buffalo, No. 1, R. R.	13.50-14.00
Buffalo, No. 1	13.00-13.50
Buffalo, No. 2	11.00-11.50
Chicago, No. 1	13.25-13.75
Chicago, auto, no alloy	12.00-12.50
Chicago, No. 2 auto	10.50-11.00
Cincinnati, dealers	11.00-11.50
Cleveland, No. 1	13.75-14.25
Cleveland, No. 2	12.50-13.00
Detroit, No. 1	10.00-10.50
Detroit, No. 2	9.50-10.00
Eastern Pa., No. 1	15.50
Eastern Pa., No. 2	13.00-13.50
Federal, Ill.	11.25-11.75
Granite City, R. R.	11.25-11.75
Granite City, No. 2	10.50-11.00
Los Angeles, No. 1	13.00-14.00
Los Angeles, No. 2	12.00-13.00
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.00-16.50
Pittsburgh, No. 1	15.00-15.50
Pittsburgh, No. 2	13.50-14.00
St. Louis, R. R.	11.50-12.00
St. Louis, No. 2	10.50-11.00
San Francisco, No. 1	13.00-13.50
Seattle, No. 1	11.00-12.00
Toronto, dlrs. No. 1	9.25-9.75
Valleys, No. 1	14.50-15.00

## COMPRESSED SHEETS

Buffalo	11.00-11.50
Chicago, factory	12.50-13.00
Chicago, dealers	11.50-12.00
Cincinnati dealers	10.50-11.00
Cleveland	13.75-14.25
Detroit	11.25-11.75
E. Pa., new mat.	15.50
E. Pa., old mat.	11.50-12.00
Los Angeles	14.00-14.50
Pittsburgh	15.00-15.50
St. Louis	9.50-10.00
Valleys	14.00-14.50

## BUNDLED SHEETS

Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	10.00-10.50
Cleveland	9.50-10.00
Los Angeles	14.00
Pittsburgh	13.75-14.25
St. Louis	7.00-7.50
Toronto, dealers	8.00-8.50

## SHEET CLIPPINGS, LOOSE

Chicago	8.00-8.50
Cincinnati, dealers	6.50-7.00
Detroit	8.00-8.50
†Los Angeles	3.75-4.00
St. Louis	6.00-6.50
Toronto, dealers	4.25-4.75

## BUSHELING

Buffalo, No. 1	11.00-11.50
Chicago, No. 1	12.00-12.50
Cincin., No. 1, deal.	7.00-7.50
Cincinnati, No. 2	2.25-2.75
Cleveland, No. 2	7.50-8.00
Detroit, No. 1, new	10.00-10.50
Valleys, new, No. 1	13.50-14.00
Toronto, dealers	3.75-4.25

## MACHINE TURNINGS (Long)

Birmingham	4.50-5.00
Buffalo	6.00-6.50
Chicago	7.00-7.50
Cincinnati, dealers	4.50-5.00

Cleveland, no alloy	7.25-7.75
Detroit	5.00-5.50
Eastern Pa.	8.50
Los Angeles	4.50-5.00
New York	4.35-4.00
Pittsburgh	9.00-9.50
St. Louis	4.50-5.00
Toronto, dealers	4.25-4.75
Valleys	9.00-9.50

## SHOVELING TURNINGS

Buffalo	7.25-7.75
Cleveland	7.50-8.00
Chicago	7.00-7.50
Chicago, spl. anal.	8.00-8.50
Detroit	6.00-6.50
Pitts., alloy-free	10.25-10.75

## BORINGS AND TURNINGS

*For Blast Furnace Use*

Boston district	2.00
Buffalo	6.75-7.25
Cincinnati, dealers	3.25-3.75
Cleveland	7.50-8.00
Eastern Pa.	6.50-7.00
Detroit	5.00-5.50
New York	4.25-3.00
Pittsburgh	6.50-7.00
Toronto, dealers	3.50-4.00

## AXLE TURNINGS

Boston district	7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	13.50-14.00
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.00-9.50
Toronto	4.00-4.25

## CAST IRON BORINGS

Birmingham	6.00-6.50
Boston dist. chem.	4.50
Buffalo	6.75-7.25
Chicago	6.50-7.00
Cincinnati, dealers	3.25-3.75
Cleveland	7.50-8.00
Detroit	5.00-5.50
E. Pa., chemical	10.00-11.00
New York	13.50-14.00
St. Louis	2.50-3.00
Toronto, dealers	3.75-4.25

## RAILROAD SPECIALTIES

Chicago	15.25-15.75
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## ANGLE BARS—STEEL

Chicago	15.25-15.75
St. Louis	13.00-13.50

## SPRINGS

Buffalo	15.50-16.00
Chicago, coil	16.50-17.00
Chicago, leaf	15.00-15.50
Eastern Pa.	18.00
Pittsburgh	18.00-18.50
St. Louis	14.00-14.50

## STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	16.50-17.00
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	16.75-17.25
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.50-19.00
St. Louis, 2 ft. & less	16.25-16.75

## STEEL RAILS, SCRAP

Boston district	13.50-14.00
Buffalo	15.50-16.00
Chicago	13.50-14.00
Cleveland	16.50-17.00

Pittsburgh	16.00-16.50
St. Louis	13.00-13.50
Seattle	16.00

## FROGS, SWITCHES

Chicago	13.50-14.00
St. Louis, cut	13.00-13.50

## ARCH BARS, TRANSOMS

St. Louis	13.50-14.00
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## PIPE AND FLUES

Chicago, net	8.50-9.00
Cincinnati, dealers	6.50-7.00

## RAILROAD GRATE BARS

Buffalo	9.00-9.50
Chicago, net	7.50-8.00
Cincinnati, dealers	6.25-6.75
Eastern Pa.	12.50-13.00
New York	8.50-9.00
St. Louis	8.00-8.50

## RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	9.50-10.00
Eastern Pa., No. 1	16.00-16.50
St. Louis, No. 1	9.75-10.25
St. Louis, No. 2	11.50-12.00

## FORGE FLASHINGS

Boston district	7.50
Buffalo	11.00-11.50
Cleveland	11.00-11.50
Detroit	9.50-10.00
Los Angeles	9.00
Pittsburgh	13.75-14.25

## FORGE SCRAP

Boston district	6.50
Chicago, heavy	15.50-16.00

## LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

## LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa., crops	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

## RAILS FOR ROLLING

*5 feet and over*

Birmingham	14.00-15.00
Boston	15.00-15.50
Chicago	17.50-18.00
New York	14.00-14.50
Eastern Pa.	17.00-17.50
St. Louis	16.00-16.50

## STEEL CAR AXLES

Birmingham	15.00-16.00
Boston district	14.50
Chicago, net	17.50-18.00
Eastern Pa.	20.50-21.00
St. Louis	16.00-16.50

## LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	12.25-12.75

## SHAPING

Boston district	15.25-15.50
New York	15.50-16.00

## CAR WHEELS

Birmingham	13.00
Boston dist., iron	14.00
Buffalo, steel	14.00
Chicago, iron	14.00
Chicago, rolled steel	14.00
Cincin., iron, deal.	12.00
Eastern Pa., iron	15.00
Eastern Pa., steel	15.00
Pittsburgh, iron	14.00
Pittsburgh, steel	18.00
St. Louis, iron	14.00
St. Louis, iron	14.00

## NO. 1 CAST SCRAP

Birmingham	13.00
Boston, No. 1 mach.	11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	12.00
Buffalo, cupola	13.00
Buffalo, mach.	14.00
Chicago, agri. net	9.00
Chicago, auto net	12.00
Chicago, railroad net	11.00
Chicago, mach. net	12.00
Cincin., mach. deal.	12.00
Cleveland, mach.	17.00
Detroit, cupola, net	12.00
Eastern Pa., cupola	16.00
E. Pa., mixed yard	13.00
Los Angeles, net	13.00
Pittsburgh, cupola	15.00
San Francisco, del.	13.00
Seattle	12.00
St. Louis, cupola	12.00
St. Louis, agri. mach.	14.00
St. L., No. 1 mach.	14.00
Toronto, No. 1, mach., net	12.00

## HEAVY CAST

Boston dist. break	12.00
New England, del.	12.00
Buffalo, break	11.00
Cleveland, break, net	13.00
Detroit, auto net	12.00
Detroit, break	9.00
Eastern Pa.	12.00
Los Ang., auto, net	12.00
New York, break	10.00
Pittsburgh, break	12.00

## STOVE PLATE

Birmingham	17.00
Boston district	18.00
Buffalo	11.00
Chicago, net	7.00
Cincinnati, dealers	6.00
Detroit, net	7.00
Eastern Pa.	12.00
New York, rdy.	10.00
St. Louis	7.00
Toronto dealers, net	6.00

## MALLEABLE

Birmingham, R. R.	10.00
New England, del.	11.00
Buffalo	15.00
Chicago, R. R.	15.00
Cincin., agri., deal.	15.00
Cleveland, rail	15.00
Eastern Pa., R. R.	15.00
Los Angeles	17.00
Pittsburgh, rail	15.00
St. Louis, R. R.	12.00

## Manganese Ore

Prices not including duty per unit cargo lot	
Caucasian, 50-52% nom.	27.00
So. African, 50-52% nom.	27.00
Indian, 49-50%	27.00

## Iron Ore

<b>Lake Superior Ore</b>	
<i>Gross ton, 51 1/4%</i>	
<i>Lower Lake Ports</i>	
Old range bessemer	\$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

<b>Eastern Local Ore</b>	
<i>Cents, unit, del. E. Pa.</i>	
<i>Foundry and basic</i>	
56.63% con.	9.00-9.25
<i>Cop.-free low phos.</i>	
58-60%	nominal
<b>Foreign Ore</b>	
<i>Cents per unit, c.i.f. Atlantic</i>	
<i>Foreign manganiferous ore, 45.55%</i>	
iron, 6-10% man.	12.00
nom.	12.00

No. Afr. low phos.	12.00
Swedish low phos.	12.00
Spanish No. Africa basic, 50 to 60%	10.00-10.50
Tungsten, short ton unit, duty pd. nom.	17.50-18.00
N. F., rdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	\$23.00-24.00
Molybdenum ores sulphide, per lb.	



# Sheets, Strip

Sheet & Strip Prices, Pages 70, 71

**Birmingham**—Sheet releases for automobile parts are commencing to appear. Orders direct from manufacturers have yet to be issued in large volume, but miscellaneous orders elsewhere coupled with orders from partsmakers have increased shipping instructions. A substantial upturn in production is looked for within the next few weeks. Output late last year gained a trifle, sheet mill output up above 55 per cent, with hot rolled strip mills at 35 per cent. Increased sheet production is expected at 50. The price situation has improved following recent adjustments.

**Philadelphia**—Sheet producers are moving toward firmer prices. In an attempt to correct the unsettled situation in galvanized material, some mills have indicated withdrawal of quotations below 3.50c base. Consignments of \$8 a ton or more previously had been made on occasions. Prices are being adhered to on cold-rolled grades. Some business is being received in the West despite recent forward cover. Releases are improving gradually but slow automotive demand is holding mill schedules.

**St. Louis**—Automotive sheet releases are slightly heavier, but no large bulge is expected until July, 1940 model preparations are advanced. Sales are steady but light and generally to a limited list of miscellaneous consignees.

**New York**—Specifications continuing substantial, producers striving to complete shipments as early in the third quarter as possible. New orders are light, jobbers and most consumers having covered their needs fully on industrial grades. Prices are also steadying, although some shading in galvanized crops from time to time. It was in the third quarter the minimum of buying was made during the recent weak demand. Cold strip demand, notably in specialty lines has improved slightly with some business placed for third quarter. Forward tonnage is appearing in small quantities of household appliances and automotive accessory manufacturers. Shading appears to be gradually disappearing. Strip operations have not improved, in periods being effective at plants.

**Philadelphia**—Specifications for sheet orders are slow to appear, indicating shipments of such material will extend well through the third quarter. Talk of continued

## ANNOUNCING G-E GLYPTAL, No. 1294

Prevents Adhesion of Weld  
Spatter, Prevents Corrosion



Sample lap weld treated with Glyptal No. 1294 Gray before arc welding. Note the spatter-free surfaces adjacent to the weld. Overlapped edges are protected against corrosion.

Typical fillet weld on plates not protected by Glyptal No. 1294. Note the weld spatter that must be chipped off before finishing.



### APPLICATIONS

This new coating compound is now available in two varieties:

**Glyptal No. 1294 Clear**—Prevents adhesion of weld spatter and resists corrosion of steel in storage.

**Glyptal No. 1294 Gray**—Provides all the advantages of the clear variety. In addition, it prevents corrosion of surfaces inaccessible after welding, such as the overlapping edges of a lap joint. It can also be used with resistance welding.

### ADVANTAGES

The use of either variety saves practically all the time otherwise required for cleaning weld spatter from surfaces which are to be finished. A single coating serves for both singlepass and multipass welds. It need not be removed after welding—in fact, it serves as an excellent base or primer for paint. Either variety can be sprayed or brushed—coverage per gallon is approximately 500 square feet for the clear and 400 square feet for the gray. Neither causes injurious fumes or smoke to form on the welder's glass. Neither causes porosity or carbon to injure the ductility of the weld.

Try some of this material today. See what a big saving it makes in your fabrication costs. Call the nearest G-E arc-welding distributor or G-E sales office, or write General Electric, Schenectady, N. Y.

**GENERAL ELECTRIC**

140-95

price concessions is subsiding, and a few odd lots now are being placed at full published prices. E. G. Budd Mfg. Co. has the contract for Willys-Overland bodies, which will divert some sheet tonnage from other districts. Stovemakers are more active.

**Birmingham, Ala.** — While new buying continues mostly miscellaneous, volume is sufficient to maintain production near capacity. Strip production is on a reduced schedule, the product being stocked against need in the coming cotton season.

**Buffalo**—Flat-rolled releases and

new orders have tapered slightly, part of it being seasonal. No appreciable gain in demand is looked for until the automotive industry releases larger tonnages for new models. Sheet and strip production ranges from 40 to 50 per cent.

**St. Louis**—Sheet and strip production is steady, but new business is slow. Enameling stock is quiet, but improvement is looked for next month when stove plants are expected to increase operations. Galvanized sheets are moving somewhat better than during early June.

## Plates

Plate Prices, Page 70

**Chicago** — Some improvement in plate demand for oil industry requirements is reported. Freight building and repairs are providing moderate support to business. Miscellaneous orders are off slightly.

**Boston**—Plate buying has declined slightly, with practically no new projects up for estimation in this district. Releases and specifications from shipyards are steady but not impressive. Except for orders for oil tanks for the State of Massachusetts, East Boston, Mass., to Chicago Bridge & Iron Co., Chicago, work is light. Shading of prices from \$2 to \$3 a ton continues.

**New York**—While plate specifications by shipyards are steady, frequently linked with shapes and limits distribution in some instances current buying continues dull in the absence of specified work. Steel and structural shops are taking orders in tonnage. Floor plate business is steady, but in small lots. Prices are still subject to sharp fluctuations of \$2 to \$3 a ton. In numerous instances fabrication-in-transit orders are met, although some price concessions of around \$2 a ton are expected.

**Philadelphia** — Producers are holding a firmer stand on plate prices. The 2.10c base is expected to hold generally no later than third quarter. On 500 tons of plates for Reading railroad 2.00c was quoted but this is said to have climbed in recent weakness. Pennsylvania Railroad will supply from its own stock part of the plates required for tenders and for repairs to 100,000 tons. The Chester, Pa., mill is building is expected in the near future for a considerable tonnage in two weeks. Harrisburg, Pa., has taken bids July 11 on pipe required for 9000 tons of plates.

**Birmingham, Ala.**—While considerable plate business is in production current bookings remain somewhat below expectations, even in the face of some improvement noted in the past few weeks ago. Output is around 100 per cent.

**Seattle** — Inquiry for plate has been confined mostly to projects for 100 tons for storage tank and other jobs. Unstated quantities of plate are involved in spillway, outlet and control work on the Sublett dam, Cassia county, Idaho, bids opened at Washington 20.

**San Francisco** — The only new letting of size went to Chicago Bridge & Iron Co., Chicago, 150 tons for a 300,000-gallon tank for Chord Field, Wash. No award



*As Dependable*  
**AS A LIGHTHOUSE  
BEACON!**

Just as lighthouse beacons are constantly on the job to protect ships, Roper Pumps protect your mill against shut downs.

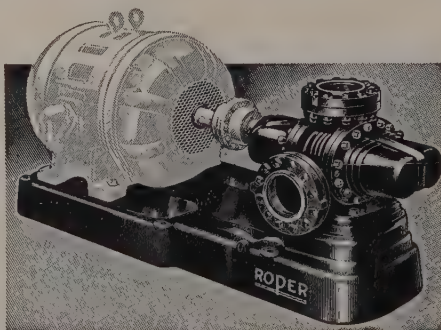
Proof that Ropers are "best by test" is evidenced by the ever increasing list of satisfied users. It includes nearly all modern steel mills and manufacturers of steel mill equipment. The reason?—Roper Pumps are designed and built to deliver **DEPENDABLE**, trouble free service and long life.

To get **REAL** pumping satisfaction required by most steel men—specify and demand "**ROPER**".

**GEO. D. ROPER  
CORPORATION**

*Main Office*  
**ROCKFORD, ILLINOIS**

*Branches*  
Pittsburgh and other principal cities.



**ROPER Rotary PUMPS**  
DEPENDABLE SINCE 1857



made on 400 tons for a contract for the Pacific Gas & Co. at Sonora, Calif. Awards totaled only 160 tons, bringing the total to 17,409 tons, compared with 14,257 tons for the corresponding period in 1938.

**St. Louis** — Socony-Vacuum Oil Co. ordered tanks, involving 100,000-gallon plates, for its new bulk storage tanks. Ten additional tanks of more than 100,000-gallon total capacity are to be erected.

## Contracts Placed

At St. Louis, Socony-Vacuum Oil Co. ordered 300 tons to Atlantic Works, 105 tons to Alpha Sheet Metal Mfg. Co., St. Louis, through B. C. Wagner, St. Louis, general contractor.

At East Boston, Mass., two oil storage tanks, East Boston, Mass., to Chicago Bridge & Iron Works, Chicago.

A 300,000-gallon tank, McChord Co., Wash., to Chicago Bridge & Iron Works, Chicago.

## Contracts Pending

At Harrisburg, Pa., contract No. 4, water supply involving 100,000 feet 42-inch pipe, Harrisburg, Pa.; bids July 1.

At Oakland, Calif., welded steel pipe, east bay water utility district, Oakland, Calif.; bids opened.

## FANS

Bar Prices, Page 70

**Philadelphia** — Despite recent protests from consumers against current prices, producers indicate intention of adhering to this schedule through the month. At that time prices on steel and over will be \$1 a ton higher than under the old setup, including quantity deductions. However, business is being accepted at whichever schedule is most advantageous to the buyer. The market is fairly steady and moderate, heavier than a month ago.

**St. Louis** — Demand for carbon and steel is lighter here, some iron and steel feeling a sharp drop in new orders. Automotive needs have been small recently, while agricultural equipment demand has increased rapidly since closing of some manufacturing plants after July 4. Industrial tracings and requirements still are fair but not heavy.

**Philadelphia** — Producers expect difficulty in applying the new schedule structure next quarter, in an advance of \$1 a ton to buyers. Bars are moving well but usually in small lots. Orders for small tools are busy, especially from the airplane industry. Makers of larger tools are backlogs of foreign busi-

ness. Movement through warehouses is sustained but not much higher than a year ago.

**New York** — Demand for merchant carbon and cold-finished bars is slow, buying being barely maintained. While some are placing a few larger orders to get in before the elimination of quantity extras July 1, resulting in a \$1 increase on such lots, the aggregate has not been heavy. Alloy bars are moving steadily.

**Birmingham, Ala.** — Bar business continues well maintained, mostly in concrete reinforcing. Construc-

tion projects under consideration are likely to add materially to tonnage during the next few weeks.

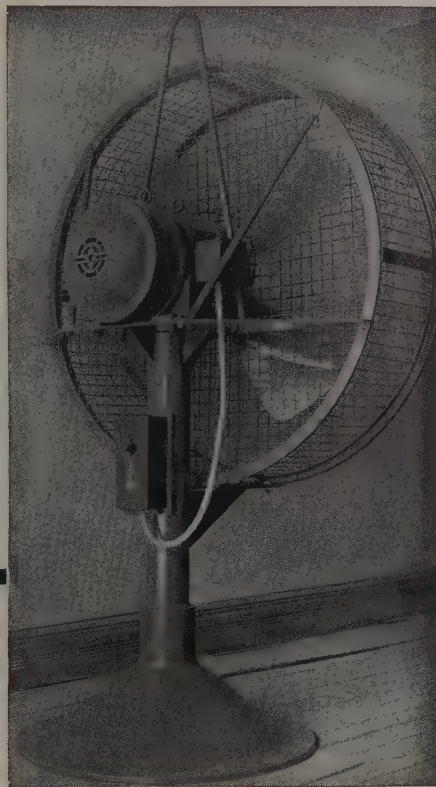
**Buffalo** — Bar production is steady despite an almost complete lapse in automotive releases. Miscellaneous demand is the chief support, with a fair volume moving into structural outlets.

## Wire

Wire Prices, Page 71

**Pittsburgh** — Wire products prices are firmer, but new business permits

## AMERICAN LEAGUE PITCHER FANS 18!



Well, that's not so important: TRUFLO MANCOOLER PORTABLE FANS fan THOUSANDS of workmen every day, and if it doesn't get into the baseball records, it

DOES get into production records. When heat presses in, work slackens, employees pant, efficiency loosens up, and the old production curve takes a dive. TRUFLO MANCOOLER PORTABLE FANS produce comfortable temperatures without drafts; they produce comfortable workers, greater efficiency and better working conditions in spite of enervating heat. Leading steel plants use TRUFLO FANS extensively, and they are always found in those parts of up-to-date plants where intense heat is encountered. Write at once for information. We have a complete line of cooling fans, blowers, exhaust fans and wall fans.



# TRUFLO FAN CO.

HARMONY, PA.  
PITTSBURGH DISTRICT  
Phone ZELIENOPLE 293

only a moderate test. Manufacturers' wire orders are light, with miscellaneous demand and small orders forming the larger part of current production. Prices are firm.

**Cleveland** — Prices of merchant wire products are more generally held to official levels, following widespread weakness for many months. Demand recently has been somewhat better than expected, the seasonal letdown commonly experienced having been less pronounced than usual. This has helped to strengthen prices. Manufacturers' wire business is fairly steady but

includes little automotive tonnage.

**New York**—Manufacturers' wire demand is holding better than most wire products, the aggregate volume of which is barely maintained. There has been a slight decline in buying of spring wire; also heavier products, including wire rope. While some price weakness appears on specialties, quotations as a rule are fairly well held, flat wires being scattered exceptions. Wire rod buying is slack and merchant products are also dragging. Electrical building goods continue weak.

**Birmingham, Ala.**—Wire business

is well diversified and has slight variation during the past weeks. Manufacturers' wire fairly steady demand and production is at approximately 65 per cent capacity.

## Pipe

Pipe Prices, Page 71

**Pittsburgh** — Business stable change, oil country demanding off slightly since a month. Merchant pipe orders for building construction are fair. Standard prices in secondary market weak in some sections. Mechanical tubing and boiler tube demand light, with little coming from automotive interests.

**Cleveland** — Standard pipe prices have tended upward recent weeks in response to increasing building requirements. Neither pipe nor municipal cast iron inquiries include large lots, and demand for oil country goods generally is unchanged and relatively stable.

**New York**—Demand for steel for plumbing and heating has improved moderately as a number of public projects and housing ventures have reached a state ready for pipe. A Syracuse, N. Y., project take close to 300 tons. Industrial and utilities demand is light.

**Birmingham, Ala.**—Pipe manufacturers are cheerful and current a five day week in most instances. While no unusual tonnage in hand, last month was satisfactory with prospects for continued activity during June.

**Seattle** — Bids were received for Seattle June 22 for the Warren avenue extension involving 900 tons awarded all cast iron, or 40 per cent if the 24-inch pipe goes steel. 250 tons is involved in the Vista Heights district improvement. Salem, Oreg., 2 to 6-inch pipe specified, alternate for cast iron and transite.

**San Francisco** — Awards for iron pipe were limited to lots of less than 100 tons and pending but does not exceed 600 tons. Total this year 16,374 tons have been booked, compared with 14,330 for the same period a year ago.

## Steel Pipe Pending

793 tons, plain end seamless, specification C-591, Long Beach, California opened.

## Cast Pipe Pending

900 tons (if all cast iron) 24-inch smaller, Warren avenue extension Seattle; bids June 22. (alternate part steel).

## FROM ORE TO METAL

The Story of St. Joe Electro-Thermic Zinc—Number 4 of a Series



### At the Bottom of the Stope

In the Balmat zinc mine of the St. Joseph Lead Company the broken ore is screened by a steel "grizzly." The larger boulders have to be broken by sledge or powder. This "grizzly" is the first screening operation. The broken ore drops between the

steel beams and falls into the underground ore chute. The miner wears a hard hat to protect his head, safety shoes with steel reinforced toe caps to protect his feet, and goggles for eye protection. He works alone in the sub-drift and his function is to keep the broken ore moving toward the haulage level below

**ST. JOSEPH LEAD COMPANY**  
250 PARK AVENUE • NEW YORK

ELdorado 5-3200

PLANT AND LABORATORY, JOSEPHTOWN, BEAVER COUNTY, PENNSYLVANIA



2 to 6-inch, Vista Heights dis-  
alem, Oreg. (Alternates for  
id transite); bids soon.  
2 to 8-inch, Tucson, Ariz.;  
pipe purchased.

## ills, Cars

Material Prices, Page 71

ad buying is at a minimum,  
le in prospect. Chicago &  
Western is expected to re-  
ortly for 800 cars. Illinois  
has shown no intention of  
n its inquiry for 1000 gon-  
w several months old. Mis-  
souri, subsidiary of Missouri  
has placed 150 cars.

purchases of rails and ac-  
have been made recently  
mills are nearing the end of  
cklogs and no substantial  
s in sight.

## Orders Placed

Illinois, 125 box cars, 25 gon-  
0-ton capacity, to Mt. Vernon  
Co., Mt. Vernon, Ill.; in addi-  
150 cars ordered in April.

## Booked

Car & Foundry Motors Co.,  
ork: Nine 37-passenger for  
e Train Transportation Co.,  
Kans.; four 37-passenger for  
stern Greyhound Lines, Lex-  
Ky.; three 37-passenger for  
us Co., Jacksonville, Fla.; two  
nger for Southern Kansas  
nd Lines Inc., Kansas City,  
o 34-passenger for Saugus  
Co., Saugus, Mass.; two 35-  
er for Safeway Trails Inc.,  
ton.

## apes

ral Shape Prices, Page 70

ugh — Structural awards  
fairly heavy. Inquiries  
e and there is little change  
onnage on the market.  
are fair on most jobs, al-

## Awards Compared

	Tons
led June 24.....	17,494
led June 17.....	15,598
led June 10.....	22,416
k, 1938 .....	11,387
verage, year, 1938	21,568
verage, 1939 .....	22,701
verage, May.....	23,691
date, 1938 .....	405,567
date, 1939.....	567,729
awards of 100 tons or more.	

though weakness has been reported  
in eastern sections. Tonnage is now  
being placed on several parts of the  
Pennsylvania turnpike, and several  
other government projects account  
for a large part of current place-  
ments, but there are also numerous  
private jobs.

**Cleveland** — Structural activity is  
receiving fair support from small  
miscellaneous jobs, with several  
large tonnages included in awards  
and inquiries. Major pending items  
are bridges and schools, including  
770 tons for three state bridges  
bid recently. For the West Third

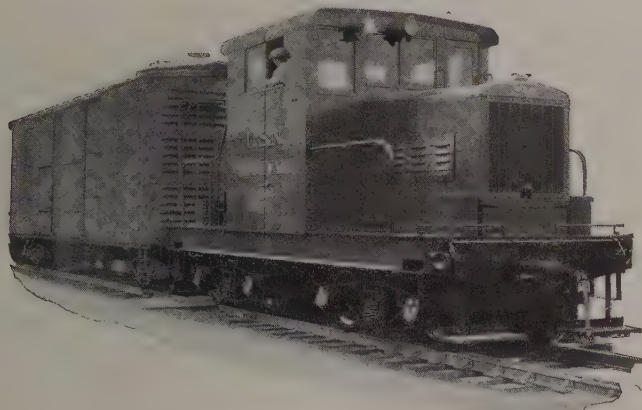
street bridge here 1660 tons has  
been placed. Principal private order  
is 560 tons for a machine shop,  
Lima, O.

**Chicago** — Significant structural  
awards have been noticeably lack-  
ing but weight of pending projects  
is bolstered by a number of new  
inquiries.

The first of the long-awaited new  
constructions for Northwestern uni-  
versity has come out in the form of  
an inquiry involving 600 tons of  
structural steel for Abbott Hall, uni-  
versity men's dormitory.

Chicago housing authority is ad

## ATLAS GAS-ELECTRIC LOCOMOTIVES



45 Ton Locomotive especially suitable for economical interplant  
switching service.

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Gas-Electric and Diesel-Electric Locomotives . . .  
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Furnaces . . . Concentrate and Calcine Cars for  
Copper Refineries . . . Automatic and Remote  
Controlled Electric Cars . . . Pushers, Lev-  
ellers and Door Extractors . . . Coal Charg-  
ing Lorries, Coke Guides and Clay  
Carriers . . . Atlas Patented Coke  
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Coke Ovens . . . Atlas Patented  
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trically Operated Cars  
for every conceiv-  
able Purpose.

## THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

# Behind the Scenes with STEEL

## We Pay The Postage

■ Every week, it seems, some one about the country finds one of our frequently used business reply cards (on which we pay the postage) and gets a tremendous urge to speak his piece on communism, the revival of head hunting on the west coast of Africa, or why are the Brooklyn Dodgers. So used to it, are we by now, that it takes something with a pretty decent twist to cause the slightest ruffle. Such was one from Huntington, W. Va., last week. Not being the stingy type our pal used two cards which gave us these pearly thoughts for a cost of only four cents: (1) *Am helping to increase post office revenue and help restore confidence in the national debt.* (2) *I read your magazine regularly. Like your criticisms of everything. Don't agree with any of your opinions. Nice guy!*

## Whatta Life!

■ Comes an editorial release on a new laying cage for egg production which offers the motherly type of chicken every modern convenience during her travail. To provide the very best of care for the little woman and to conserve her strength, "water is provided from a nipple situated in such a way that the water runs down the throat and eliminates the excess motion of raising and lowering the head." Utopia, apparently, has come at last to the lowly chicken while we poor mortals still grope about blindly for the more abundant life.

## A Nice Story

■ And in the mail last week we learned of a real human interest application of modern industrial handling equipment. It seems an elderly lady, crippled and bed-ridden some time ago in an automobile accident longed so much for her daily tub bath that Shaw-Box Crane & Hoist engineers went to work on a most unusual job of benevolence. The

unit consists of a small push type crane, trolley, electric hoist and bos'n's chair, the hoist operating from an ordinary lamp socket. In operation the bos'n's chair is brought alongside the bed, the lady helped in and then moved, via hoist and crane, over the bath and lowered in. No dollars and cents savings are effected on the job, but a return of much joy and happiness is enthusiastically reported.

## Allen Likes Allen

■ At Inland Steel Co.'s Indiana Harbor works A. H. Allen, cover-to-cover reader of STEEL, turns first thing each Monday to his favorite feature, Mirrors of Motordom, authored by A. H. Allen, Detroit editor—no relation.

## Razing In Chicago

■ Out in Chicago, one of the first steel frame skyscrapers, the Capitol building, is being razed and the Clonick Steel Co., which is salvaging the metal, advertisers in the *Tribune: Skyscrapers — Slightly Used*. But a woman on a Michigan avenue bus one day was heard to observe, when someone pointed out how rapidly the demolishing was going ahead (if demolishing does go ahead): "My goodness, they started with the top floors, didn't they?" Which will, of course, get you to thinking of a way to raze the building from the ground up.

## Are You A Jitterbug?

■ Why Jitter? asks Revere Copper & Brass in a little pamphlet recently distributed listing sayings from "eminent pessimists of the past." William Pitt: *There is scarcely anything around us but ruin and despair.* Disraeli: *In industry, commerce and agriculture there is no hope.* Lord Grey: *Everything is tending to a convulsion.—We, got through then—and shall do so again.* Why Jitter?

SHRDLU

## —The Market Week—

vertising for bids on a low-costing project, for the colored s on the south side. Plans v available June 30 and bids v read July 25. Structural tonn as yet unestimated.

**New York**—Shading on shapes is less prevalent alt some volume continues to l at \$2 under the 2.10c bas cept for New York and New bridges inquiry is light. Bridge in sight totals close to tons.

**Philadelphia** — Structural holds near the volume of the two months. Most business public projects, the principal tion being 775 tons for a ware for Armstrong Cork Co., Lan Pa. Prices still are weak.

**Buffalo**—The structural steel ket continues fairly active w increased number of projects g under way and several other pected to start soon.

**Seattle**—Largest project u figures involves 6000 tons or for gates and other items at t dam, bids to Denver, July 12. contract for a Washington bridge in Snohomish county tons including machinery, is ing. Shops have fair sized bac

**San Francisco**—Structural a totaled only 1290 tons, bringi aggregate to date to 67,106 compared with 53,223 tons f same period last year. Bids just been opened on 446 t shapes and sheet piling for a l and barracks at the Coast air station, San Francisco, a 400 tons for a floating crane f Mare Island navy yard.

**St. Louis**—New lettings of tural steel are confined to sma with the aggregate not impr The only tonnage of moment ing is 800 tons for bridges f Oklahoma highway comm bids for which will be opene 10.

## Shape Contracts Place

4200 tons, South side vocational Chicago, to Duffin Iron Co., Ch

1660 tons, upper West Third bridge, Cleveland, to R. C. Co., Detroit.

1079 tons, highway bridge, Ross Ohio, to Fort Pitt Bridge Works burgh.

900 tons, bridge, circumferential way, Queens, to Taylor-Ficht New York.

775 tons, warehouse extension l 156A, Armstrong Cork Co., La Pa., to American Bridge Co. burgh, through Hughes, Foulki Philadelphia.

755 tons, bridge over Juniata river pike commission, Pennsylvania Phoenix Bridge Co., Phoenix



## —The Market Week—

roll and heavy machine shop, Steel Foundry Co., Lima, O., to an Bridge Co., Pittsburgh.

beam and truss spans, Marion Iowa, to Pittsburgh-Des Moines Co., Des Moines, Iowa.

addition to process building miscellaneous supports, Hercules Co., Parlin, N. J., to American Co., Pittsburgh.

reconstruction of Chicago & Midland railroad bridge, Oak-Id., for U. S. government, to Hem Steel Co., Bethlehem, Pa.

bridge, Seaboard Air Line rail-geeteechee river, Georgia, to Beth-Steel Co., Bethlehem, Pa.

highway bridges, Pennsylvania, Somerset county, Pennsylv- to Bethlehem Steel Co., Beth-Pa.

Pennsylvania turnpike bridge, et county, to Bethlehem Steel ethelem, Pa., through H. R., Philadelphia.

electric generating plant, Hol-ich., for city, to Steel Fabri-Co., Muskegon, Mich.

Bowen high school, Chicago, to tt Bridge Works, Pittsburgh.

s, approach to Twenty-third viaduct, Denver, to Midwest Iron Works Co., Denver.

Goodyear mill, Gadsden, Ala., inia Bridge Co., Roanoke, Va.

s, bridge FAP-132-A, Parker Texas, to Austin Bros., Dallas,

Chicago, Milwaukee, St. Paul ic railroad, columns for rein- Chicago, to American Bridge tsburgh.

contract 417, Westchester coun-York, to American Bridge Co., rgh.

s, sewage treatment plant, eld, Mass., to National Steel s Co., Hartford, Conn.; through onstruction Co., New York.

Denton's store, Springfield, O., Morris Co., Columbus, O.

service building, etc., agricul-laboratory, Wyndmoor, Pa., to Structural Steel Co., Allen-Pa.

women's dormitory, Miami uni-Oxford, O., to Ohio Structural Co., Newton Falls, O.

recovery building, Hercules Co., Parlin, N. J., to unknown or.

highway bridge FAP-35 (2), unt, Mississippi, to Vincennes Co., Vincennes, Ind.

machine building No. 16, Scott Co., Chester, Pa., to Bethlehem tors, Bethlehem, Pa.

United States post office build-land, Wis., to Lakeside Bridge Co., Milwaukee.

bridge 216-5-39, Erie county, N. Y., to R. S. McMannus Steel ction Co. Inc., Buffalo.

bridge, FAGH-813-A, Erath Texas, to North Texas Iron Co., Ft. Worth, Tex.

towers for water and power ent, specification 3022, Los, to Pennsylvania Iron & Steel s Angeles.

office and warehouse build-S. government, St. Louis, to Bros. Bridge & Iron Co., St.

steel racks, water and power

department, specification 3041, Los Angeles, to Pennsylvania Iron & Steel Co., Los Angeles.

130 tons, Chicago, Milwaukee, St. Paul & Pacific railway fruit house, St. Paul, to Minneapolis-Moline Power Imple-ment Co., Minneapolis.

125 tons, highway bridge LR-49, Penn-sylvania turnpike, Somerset county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

125 tons, building, Bucknell University, Lewisburg, Pa., to Lehigh Structural Steel Co., Allentown, Pa., through Sar-doni Construction Co.

115 tons, miscellaneous bridges, Adams and Arapahoe counties, Colorado, to Kansas City Structural Steel Co., Kan-sas City, Kans.

105 tons, school swimming pool and sports building, Beverly Hills, Calif., to unnamed interest.

100 tons, soy bean plant, Decatur, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

100 tons, Pajaro Valley National Bank, Watsonville, Calif., to Herrick Iron Works, Oakland, Calif.

## Shape Contracts Pending

2300 tons, mill basin Bascule bridge, Brooklyn; bids July 6.

1200 tons, plant addition, National Gyp-sum Co., New York.

1000 tons, grade separation, Saginaw, Mich., for state.

996 tons, Colorado river bridge, San Sada, Tex.; bids June 27.

950 tons, bridges, Midtown tunnel, New York, for city.

900 tons, Stillman college building, Yale university, New Haven, Conn.

800 tons, Oklahoma highway commis-sion, for five highway bridges; bids June 10.

800 tons, piling, Melwood, Ark., Little Island Bayou outlet, for U. S. en-gineers.

780 tons, highway bridge, Marland, Okla.; bids June 27.

725 tons, highway bridges, Pennsylvania turnpike, Somerset county, Pennsylv-ania.

600 tons, Abbott Hall men's dormitory, Northwestern university, McKinlock



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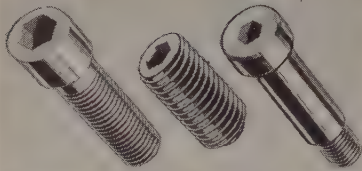
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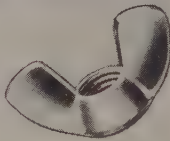
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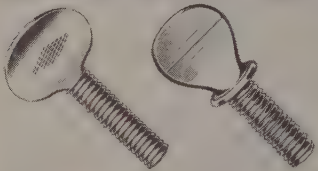


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## Wing Nuts



## Thumb Screws



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**P**RODUCTS of an improved process developed through years of experience in the manufacture of precision screw products, Parker-Kalon Cold-forged Socket Screws, Cap Nuts, Wing Nuts and Thumb Screws possess that *strength, uniformity and accuracy* that spell Q-U-A-L-I-T-Y. Stocked by reliable industrial distributors near you. Write for free samples . . . compare . . . see for yourself.

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# PARKER-KALON

*Cold-forged*

**SOCKET SCREWS  
WING NUTS · CAP NUTS  
THUMB SCREWS**

SOLD THROUGH REPUTABLE DISTRIBUTORS

## —The Market Week—

campus, Chicago; R. C. Wieboldt Co., Chicago, general contractor.

600 tons, highway bridges, Pennsylvania turnpike, Westmoreland county, Pennsylvania.

550 tons, Brockport state normal school, Brockport, N. Y.; Grosline & Swan Construction Co., Rochester, low on general contract.

475 tons, bridge, Allegheny county, New York; C. P. Ward, Rochester, N. Y., low on general contract.

470 tons, underpass, South Damen avenue, under Wabash and Western Indiana railroads, West Seventy-fourth street, Chicago; bids June 27.

446 tons, including 246 tons sheet piling, hangar and barracks for coast guard station, Mills Field, San Francisco; bids opened.

425 tons, bridges, Texas & Pacific railroad, Fort Worth, Tex.

420 tons, state bridge, Summit county, Ohio; C. B. Moon Co., Cleveland, low for general contract.

400 tons, bridge MS-39-7, Brooklyn, N. Y.

400 tons, floating crane, specification 8975, Mare Island, Calif.; bids opened.

350 tons, shelter and skating rink, Corson & Gruman Co., Washington.

275 tons, state bridge FAP-730-C, Humboldt, Iowa.

260 tons, building for junior high school, San Francisco; bids opened.

250 tons, bridge, Hamilton county, New York; E. G. Bell, New Hartford, N. Y., low on general contract.

250 tons, state highway bridge, Detroit.

250 tons, building, Stein-Davis Co., Long Island City, N. Y.

250 tons, highway bridge, Broken Bow, Okla.; bids June 27.

240 tons, state bridge, Hopkins street, Buffalo.

235 tons, building, State normal school, New York.

230 tons, bridge, Oswego county, New York; Hackensmith Construction Co., Albany, N. Y., low on general contract.

215 tons, state bridge, Petersburg, Ill.

200 tons, grade crossing elimination, Baltimore & Ohio, Buffalo; Metzger Construction Corp., Buffalo, low on general contract.

200 tons, state bridge, Richland county, Ohio; George B. Harring & Sons, Mansfield, O., low for general contract.

200 tons, state bridge, Lake Mills, Wis.

180 tons, repairs to bridge 455, Great Northern railway, Snohomish, Wash.

175 tons, municipal office building, Chicago.

175 tons, state bridge, Johnson Creek, Wis.

175 tons, factory and office building, H. J. Heinz Co., Newark, N. J.

170 tons, state bridge, Cecil, Wis.

150 tons, bank building, Ridgewood Savings bank, Forest Hills, N. Y.

150 tons, state bridge, Lucas county, Ohio; C. B. Moon Co., Cleveland, low for general contract.

150 tons, store building, J. J. Newberry Co., Framingham, Mass.

150 tons, beam spans, Warren, Me., for state.

150 tons, Outer Mission high school, San Francisco; bids opened.

130 tons, state highway bridge, Rockport, Ky.

125 tons, tunnel supports, Atchison, Topeka & Santa Fe railway, Muir, Calif.

100 tons, grade crossing, Lehigh railroad, Grandin, N. J.; also reinforcing steel and 11,600 wrought iron blast plates; bids July 7, E. Donald Sterner, state highway commissioner, Trenton, N. J.

100 tons, shapes and bars, beam bridge route 12, section 2, Hunterdon county, New Jersey; bids July 7, E. Donald Sterner, state highway commissioner, Trenton, N. J.

100 tons, Hillcrest theater, Philadelphia; bids July 3.

Unstated tonnage, additional, over Pennsylvania railroad, Bridgeport, N. J.; includes 50 tons bars.

# Reinforcing

Reinforcing Bar Prices, Page

**Pittsburgh**—Concrete bar prices placed over the past week took off the market several projects, but at the same time there was a constant influx of new projects which maintains volume. The situation remains unchanged for the moment with competition heavy particularly in the East.

**Chicago**—Pending business in concrete bars continues fairly heavy, indicating maintenance of steady demand. Major projects to come for bids in coming weeks include a south side housing development involving 124 buildings, and a story dormitory for Northwestern university.

**Boston**—Small-lot inquiry for reinforcing bars is well maintained. Awards include 1100 tons for a control dike at Holyoke, Mass., largest in the district placed by Holyoke contractor. This project also takes 1700 tons of steel piling. Including an insurance building at Boston, approximately 4500 tons are active or will be under general contract bids shortly. Prices are steadier for small lots, but large purchases bring out substantial shading.

**New York**—Buying has decreased although small lot purchases are maintained. New inquiry includes 493 tons for two circumferential highways in Queens, closing

## Concrete Bars Compared

Week ended June 24	.....
Week ended June 17	.....
Week ended June 10	.....
This week, 1938	.....
Weekly average, year, 1938	.....
Weekly average, 1939	.....
Weekly average, May	.....
Total to date, 1938	..... 1
Total to date, 1939	..... 2

Includes awards of 100 tons or more



7, and a furniture warehouse in Bronx, 652 tons. Prices are

**Philadelphia**—Reinforcing fabricators' backlogs are declining. Large jobs are active, and the work of small alterations and repair is below expectations.

**Philadelphia**—Demand is spotty, slightly improved by more activity in pre-building construction. Local have a fair amount of work. Prices continue unsteady.

**San Francisco**—Reinforcing bar aggregated 2129 tons, bringing total to date to 80,994 tons, with 46,771 tons for the bonding period in 1938. Bids just been opened on barracks at naval air base at Alameda, requiring 1485 tons, on 295 for gun battalion barracks at Fort Ord, T. H. and on 242 tons for buildings for a junior high school in San Francisco.

**Reinforcing Steel Awards**

General federal office building, Washington, to Sweets Steel Co., Harrisburg, Pa.; McCloskey & Co., contractor.

100 tons, Kittatinny-Blue Mountain road, Franklin county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, sewage plant, Fort Wayne, to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.

100 tons, Peoria, Ill., laboratory for development of agriculture, to Laclede Co., St. Louis, through O'Neil Construction Co., general contractor.

100 tons, sewage plant, Marion, Ind., to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.

100 tons, post office and federal court building, Anchorage, Alaska, to unnamed interest.

100 tons, Kammehameha school, Honolulu, to Columbia Steel Co., San Francisco.

100 tons, North Meadows pumping station, Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, fishery canal project, Grand Lake dam, Washington, to unnamed interest.

100 tons, superstructure, bridge over Mac river, Dahlgren, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Harbort Structural Steel Co., contractor.

100 tons, flood wall, East Springfield, Mass., to Joseph T. Ryerson & Son, Chicago; Lane Construction Co., contractor.

100 tons, shoe factory and employees' residences, Belcamp, Md., to Bethlehem Steel Co., Bethlehem, Pa.; Price Construction Co., contractor.

100 tons, state library building superstructure, Richmond, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Doyle Russell, contractors.

100 tons, sewage plant, Wisconsin Rapids, Wis., to Inland Steel Co., Chicago.

100 tons, state highway project FA-79-D, Martin-Meade county, Kentucky, to Inland Steel Co., St. Louis.

100 tons, ward building No. 2, Gallinger hospital, Washington, to Sweets Steel Co., Williamsport, Pa.; Jeffries-Dyer

Inc., contractor.

141 tons, water and power department, specification 3064, Los Angeles, to unnamed interest.

103 tons, treasury department, invitation 7615, Oakland, Calif., to Columbia Steel Co., San Francisco.

100 tons, auditorium, Beatrice, Nebr., to Sheffield Steel Corp., Kansas City, Mo.

100 tons, factory, Hobart Mfg. Co., Troy, O., to Republic Steel Corp., Cleveland, through Truscon Steel Co., Youngstown, O.

100 tons, commissary building, Horn & Hardart Baking Co., Philadelphia, to Truscon Steel Co., Youngstown, O.; Murphy-Quigley & Co., contractor.

100 tons, school swimming pool, Beverly Hills, Calif., to unnamed interest.

## Reinforcing Steel Pending

3350 tons, subway, section 5-S, Chicago.

1485 tons, barracks, naval air base, Alameda, Calif.; general contract to Johnson, Drake & Pipe Inc., 649 South Olive street, Los Angeles, at \$1,395,716.

500 tons, female custodial group of buildings, state hospital, Amarrillo, Calif.; bids July 6.

500 tons, Rock creek diversion sewers, section 2, Washington.

450 tons, section 9 C-2-10 and 11, Somerset and Bedford counties, Pennsylvania turnpike commission.

390 tons, section 8 B-1, Somerset county, Pennsylvania turnpike commission.

350 tons, reservoir dam and gate, contract 80, Weston, Mass.

305 tons, section 2-C, Westmoreland county, Pennsylvania turnpike commission.

295 tons, gun battalion barracks, Hickam Field, T. H.; Robert E. McKee, 4700 San Fernando road, Los Angeles, low on general contract at \$295,900.

270 tons, civic center, Great Falls, Mont.

264 tons, bridge over Raritan river, contract 3, township of Sayreville and Woodbridge, New Jersey.

242 tons, junior high school, San Francisco; bids opened.

215 tons, Mill river diversion canal, Northampton, Mass.

200 tons, Brockport state normal school, Brockport, N. Y.; Grosline & Swan Construction Co., Rochester, N. Y., low on general contract.

175 tons, state bridge, Summit county, Ohio; C. B. Moon Co., Cleveland, low for general contract.

155 tons, building for state hospital, Talmadge, Calif.; bids opened.

150 tons, sewage plant, Wausau, Wis.

109 tons, dike wall, contract D, Springfield, Mass.

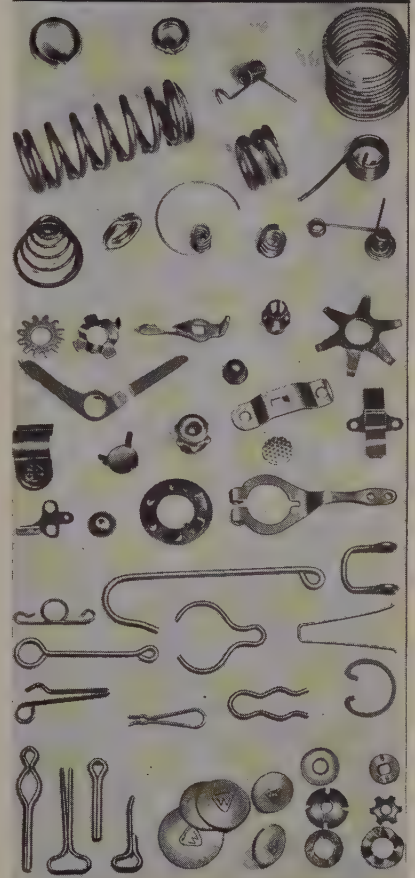
105 tons, grade elimination, Hopkins and Marilla streets, over Baltimore & Ohio railroad, Buffalo.

100 tons, bridge and approaches over Pennsylvania-Reading Seashore lines, route 51, section 1, Bridgeport, N. J.; also 83 tons, structural steel; bids July 7, E. Donald Sterner, state highway commissioner, Trenton.

100 tons, postoffice, Yuba City, Calif.; bids June 30.

Unstated tonnage, Abbott Hall, Northwestern university men's 18-story dormitory, McKinlock campus, Chicago; R. C. Wieboldt Co., Chicago, general contractor.

Unstated tonnage, Ida B. Wells housing project, Chicago; 124 buildings including powerhouse; plans available June



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30; bids July 25 to Chicago housing authority; estimated over 1000 tons. Unstated tonnage, addition to Washburn vocational school, West Division and North Sedgwick streets, Chicago. Unstated tonnage, switch house No. 2, Fisk street station, Commonwealth Edison Co., Chicago; bids on general contract June 26.

## Pig Iron

Pig Iron Prices, Page 72

**Pittsburgh** — Pig iron sales are small. Foundry demand is expected to continue light, but nonintegrated mills have been taking iron in fair volume and are seen likely to increase their needs. Reported price concessions in iron are not confirmed, with many users taking material against old low-price contracts.

**Cleveland** — Scattered reports of current and prospective betterment in foundry operations support the expectation that pig iron shipments have passed their low point for the year. However, buyers still are conservative in placing new business.

**Chicago** — Pig iron shipments showed little change the past week, but slowing down of foundry demand indicates the month will wind up about 25 per cent below May. At present, shipments are still about 15 per cent behind.

**Boston** — Slightly better operations by some foundries and a mildly improved outlook have not been reflected in heavier buying of pig iron. Prices are steady.

**New York** — Only small lots are

being booked for current or third quarter delivery, and releases against contracts are slow. Most larger consumers are well supplied with iron at the present rate of operations.

**Philadelphia** — Specifications from the stove industry have picked up considerably, with better activity expected to continue several weeks.

**Buffalo** — Pig iron sales are spot, so far in June being a trifle lighter than a month ago. Consumers' stocks are low, but releases are dictated by immediate requirements.

**Cincinnati** — Pig iron and coke are quiet in new business. Iron shipments, however, hold near the pace of late May, or about the best movement so far this year. This is due partly to the fact melters are anxious to take delivery against low-priced contracts placed late last year.

**St. Louis** — Shipments average about 10 per cent lighter than a month ago, and new business also has declined. Foundry operations are steady, lower schedules by stove and implement interests being offset by better rates elsewhere, notably among jobbing plants. Prices are firm in the face of light sales.

**Toronto, Ont.** — Sales are lighter because of quieter demand from small melters. Large users still are out of the market, and only small shipments are being made to implement and radiator manufacturers.

## Tin Plate

Tin Plate Prices, Page 70

Tin plate demand is steady, this

being reflected in sustained nation at 70 per cent. Prospects continue favorable for a maintenance of present operations for some more weeks, although needs of consumers are near the season's

## Scrap

Scrap Prices, Page 74

**Pittsburgh** — Prices continue strong, an important support factor being strength of the Yorktown market. Down-river mills furnishing heaviest demand, though local activity also is somewhat better. Quotations are changed. No. 2 steel is plentiful but No. 1 material is in limited supply.

**Chicago** — Scrap is quiet, but quotations are fairly steady despite recent indications of softness. Steel continues \$13.25 to \$13.75. Island railroad received close to \$13.75 for its steel early last

**Boston** — Except for export, buying is light with a slight increase in demand for turning eastern Pennsylvania steel. Prices paid for dock delivery are firm and tend to hold quotations on several grades. In addition, five boat loadings of heavy material steel at \$14 and \$13, dock, more No. 1 and No. 2 cast is moving to the former at \$14-\$14.50 and the latter at \$12, dock.

**New York** — Domestic scrap iron and shipments continue. Little material is moving to eastern steelworks, while foundries are ordering small lots from nearby yards. Prices generally are unchanged.

**Philadelphia** — Scrap exports here this month apparently will set a new high monthly record at 100 tons. Brokers are paying \$15.25 for No. 1 steel and \$13.75 for No. 2 despite the national cartel business reported recently at \$15 and \$13, respectively.

**Buffalo** — Scrap buying is in a lull, with prices unchanged. No. 1 steel nominally continues to \$13.50. Shipments against orders are restricted somewhat, but mills have heavy stocks.

**St. Louis** — The market is quiet and except for a 50-cent advance in machine shop turnings prices are unchanged. Little scrap is being offered, with small dealers holding their accumulations in hopes of better prices.

**Detroit** — Sentiment is less optimistic, but a few grades are in demand. Heavy melting steel is up 50 cents and bundles 25 cents. A large quantity of heavy melting steel is reported to have been placed at various lake ports for shipment

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mill in Nova Scotia. Purchases are estimated at possibly 40,000 tons. This is the first within memory of the time that Canadian interests have been in the Great Lakes market at a tonnage.

**to, Ont.** — Heavy melting is moving in fair volume to iron mills. Consumers give indications of raising their bids, and believe the next price will be upward. Cast scrap inquiries are slightly heavier. Offerings are steady, and stocks are increasing.

## Warehouse

Warehouse Prices, Page 73

**ouis**—Business this month is as expected. Rural demand improved, along with needs of mechanics users. Oil country continues active, and some items are moving well.

**Philadelphia**—June business shows change from May or April, but is encouraged by greater distribution. Light products still move most active.

**and** — Business in commodity warehouse products has done more than hold its own so far this month compared with May. Sales are maintaining improved rate of the past six months and die programs will maintain this pace for at least 30 to 60 days.

**o** — Demand is a trifle out a further decrease this month would leave June business a par with May. The approaching holiday is expected to bring a quieter market at the end of the month.

**nati** — Business is about 20 percent better than a month ago, resulting principally from increased demand from coal mines because of the shutdown. Building activity is supplying little ton-

## Nonferrous Metals

**York**—The nonferrous metal market last week successfully reasserted international tension, remaining generally steady throughout. Sales in all the major markets are regarded as satisfactory.

—Estimates place June copper sales at 50,000 tons or better. Last week was exceptionally much to producers' liking. Copper closed steady after an early rally in the week. Domestic metal continues at 10.00c, de-

Connecticut. First sales of tin from the pool were made last week at

\$230. Domestic prices were largely unchanged. Demand is steady and the market unruffled by the far eastern situation.

**Lead**—Producers advanced prices another \$1 a ton at the start of the week. Thereafter, sales eased off slightly but the week's volume

amounted to about 10,000 tons. The price is now 4.85c, New York, and 4.70c, East St. Louis.

**Zinc**—Higher London prices hardened domestic quotations at 4.50c East St. Louis, for prime western. Sales continued in good volume and the outlook is for a gradual increase.

## Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound.											
	Electro, del. Conn.	Copper Lake, del. Midwest	Casting, refinery	Straits Tin, New York Spot	Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Alumi- num 99%	Anti- mony Amer. Spot, N.Y.	Nickel Cath- odes
June											
17	10.00	10.00	9.62½	48.75	48.55	4.80	4.65	4.50	20.00	12.00	35.00
19	10.00	10.00	9.62½	49.00	48.80	4.85	4.70	4.50	20.00	12.00	35.00
20	10.00	10.00	9.62½	49.12½	48.90	4.85	4.70	4.50	20.00	12.00	35.00
21	10.00	10.00	9.62½	49.15	49.00	4.85	4.70	4.50	20.00	12.00	35.00
22	10.00	10.00	9.52½	49.10	48.95	4.85	4.70	4.50	20.00	12.00	35.00
23	10.00	10.00	9.52½	49.10	48.95	4.85	4.70	4.50	20.00	12.00	35.00

### MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 10.00c Conn. copper

Sheets	
Yellow brass (high)	16.48
Copper, hot rolled	18.12
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes	
High yellow brass	19.23
Seamless copper	18.62

Rods	
High yellow brass	11.85
Copper, hot rolled	14.62

Anodes	
Copper, untrimmed	15.37

Wire	
Yellow brass (high)	16.73

### OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass	
New York	5.75-6.00
Cleveland	6.50-6.75
Chicago	5.75-6.00
St. Louis	6.00-6.25

Heavy Copper and Wire	
New York, No. 1	7.75-7.87½
Cleveland, No. 1	7.50-7.75

Chicago, No. 1	7.37½-7.62½
St. Louis	7.50-7.75

### Composition Brass Turnings

New York	5.00-5.25
----------	-----------

Light Copper	
New York	6.25-6.50
Cleveland	5.75-6.00
Chicago	5.75-6.00
St. Louis	6.00-6.25

Light Brass	
Cleveland	3.50-3.75
Chicago	3.87½-4.12½
St. Louis	3.50-3.75

Lead	
New York	4.00-4.25
Cleveland	3.50-3.75
Chicago	3.60-3.85
St. Louis	3.50-3.75

Zinc	
New York	2.50-2.62½
Cleveland	2.00-2.25
St. Louis	2.25-2.50

Aluminum	
Borings, Cleveland	5.75-6.00
Mixed, cast, Cleveland	7.75-8.00
Clips, soft, Cleveland	13.75-14.00
Misc. cast, St. Louis	7.00-7.25

### SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads	10.25
Standard No. 12 aluminum	12.00-12.25


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# Iron Ore

Iron Ore Prices, Page 74

**Cleveland**—Twenty-five American Great Lakes ore vessels were placed in commission between May 25 and June 15. The 195 boats in service on the latter date compares with 116 a year ago, according to C. C. Lindeman, statistician for the M. A. Hanna Co. This represented 66.96 per cent of total tonnage, while only 39.43 per cent of tonnage capacity was in commission a year ago.

Lake Superior iron ore consumption in May declined 19.8 per cent from April but was 31.2 per cent larger than in May, 1938. Consumption for the first five months was 54.4 per cent ahead of last year. Stocks on hand at furnaces and on Lake Erie docks June 1 were 1.2 per cent larger than the month before but 30 per cent smaller than a year ago. Figures of the Lake Superior Iron Ore association follow:

## Consumed By Furnaces

	Gross Tons	
May, 1939	2,245,513	
Month ago	2,799,769	
Year ago	1,711,146	
Year, 1939	14,141,219	
Year, 1938	9,194,627	

## Iron Ore On Hand

	At	On Lake	Total
June 1, '39	18,835,151	4,236,063	23,071,214
Month ago	18,305,966	4,484,967	22,790,933
Year ago	27,768,441	5,243,533	33,011,974

# Steel in Europe

Foreign Steel Prices, Page 73

**London**—(By Cable)—Normal industrial business is expanding in Great Britain without prejudicing defense contracts. Demand for foundry and hematite pig iron is improving slightly. All steel departments are busy and there is

large demand for structurals for factory constructions. Black and galvanized sheet producers are fully active on material for defense shelters. Tin plate makers have removed output restrictions under active market conditions.

The Continent reports some sections of the export trade are quieter but conditions generally are satisfactory and prices firm.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Bolt and nut prices to distributors have been established for July only at 10 per cent above current levels. Late in May prices were reduced 5

per cent, the cut applying to tributors only and for application only on June business. Consequently, the new schedule raises prices above those in effect prior to reduction a month ago.

Consumers' prices are unchanged and contracts will be accepted for the entire third quarter at current figures.

Business has tended upward far this month, and inquiries for a continuation of steady or higher demand. Improvement has been fairly general, with automobile orders predominating in several districts. Railroad needs are only moderate but are an important factor in certain areas.

# Construction and Enterprise

## Ohio

**CHILLICOTHE, O.**—City, William Higley, mayor, has plans for installing a water softening plant at cost of about \$125,000.

**CLEVELAND** — Aluminum Co. of America, J. P. Dearsaugh, representative, is erecting a 60 x 150-foot factory estimated to cost approximately \$50,000.

**CLEVELAND** — Cleveland Graphite Bronze Co., Ben F. Hopkins, president, has purchased former plant of the Glenn L. Martin Co., will construct a 500,000-square foot addition and install new machinery and equipment at total cost of nearly \$2,500,000.

**DAYTON, O.**—East Dayton Tool & Die Co., R. W. Schleman, president, soon takes bids on a two-story, 80 x 125-foot engineering department and office unit costing \$40,000. W. J. Thies, Dayton, architect.

**EAST LIVERPOOL, O.** — Patterson Foundry & Machine Co., Richard L. Ca-wood, president, plans to expend \$80,000 this summer on new machine tools and equipment.

**GRANVILLE, O.** — Village, J. S.

Graham, acting mayor, proposes to remodel and enlarge its water softening plant.

**HIRAM, O.**—Village, Ralph Goddard, mayor, is beginning survey in preparation for improvements to its sewage disposal system. R. F. MacDowell, Cleveland, consulting engineer. (Noted May 15)

**WAVERLY, O.**—Village, Charles C. W. Waverly, mayor, has approved plans to issue bonds to finance a sewage disposal plant and sewerage system costing \$65,800. Consulting engineer, H. Martin, Portsmouth, O. (Noted May 15)

## Connecticut

**NEW BRITAIN, CONN.** — St. Works has awarded contract to H. & Downes, New Britain, for a 160-foot plant addition estimated to cost \$50,000.

## Rhode Island

**BRISTOL, R. I.**—Collins & Allen Corp. soon will let a contract for a 10-story, 140 x 147-foot mill costing estimated \$200,000.

## Vermont

**BARRE, VT.**—Colonial Beacon Oil Inc., W. Raphael, construction engineer in charge, Boston, asks bids for oil bulk plant and warehouse to be in all over \$50,000.

## New York

**BUFFALO**—Freuhauf Trailer Co. prepared plans and soon will take on a warehouse. G. M. Wolfe, Buffalo, architect and engineer.

**BUFFALO**—General Mills Inc., L. Davis, president, Minneapolis, soon contracts for a nine-story food processing plant estimated to cost over \$900,000. (Noted May 15.)

**SARATOGA SPRINGS, N. Y.**—O. Harvey Co. soon lets contract for two-story laboratory costing more than \$40,000. W. Vaughan, Saratoga Springs, architect.

## Michigan

**KALAMAZOO, MICH.**—American anamid & Chemical Corp., L. R. Ver- manager, has placed a contract with Miller-Davis Co., Kalamazoo, for a three-story, 100 x 300-foot chemical plant costing an estimated \$300,000.

**OWOSSO, MICH.**—Fedders Mfg.

## New Headquarters for Keystone Steel



■ Keystone Steel & Wire Co. has awarded a contract for constructing this \$200,000 administration building at Peoria, Ill. Air conditioned and acoustically treated throughout, it will contain a kitchen and cafeteria for employees, and company's printing plant. Differences in level between the structure and main highway developed interesting problems from utility and architectural viewpoints. Albert Kahn Inc., Detroit, designer and engineer



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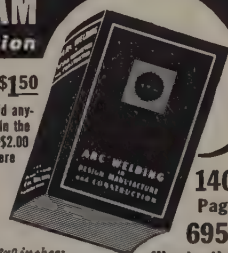
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## —Construction and Enterprise—

Inc., Buffalo, Theodore C. Fedders, vice president, has begun construction of a \$200,000 plant for manufacturing car heaters and tubular radiators.

### Indiana

GARY, IND.—City, R. E. Rowley, chairman of sanitary commissioners, asks bids until July 6 on section 2, contracts 3 and 4, involving a pump and blower house costing \$300,000, pumps, screening and blowing equipment \$225,000. PWA project. Alvord, Burdick & Howson, Chicago, consulting engineers.

HUNTINGTON, IND.—Board of public works, F. E. Cutshall, chairman, proposes to build a waterworks and light plant to cost \$145,000. Lennox & Matthews, Indianapolis, engineers.

MARION, IND.—Paranite Wire & Cable Co., A. E. Holton, president, Detroit, has plans underway for remodeling its factory here at cost of \$75,000.

### Maryland

POPES CREEK, MD.—REA has approved an additional \$160,000 allotment to Southern Maryland Tri-State Co-operative association, Wendell Reed, president, Welcome, Md., for extending rural electric lines. Of this amount \$50,000 will go for a generating plant.

### Kentucky

SCIENCE HILL, KY.—City receives bids June 28 for a waterworks costing \$48,000. H. De B. Forbes, Richmond, Ky., consulting engineer.

STRATHMOOR, KY.—Village, C. B. Jenkins, Louisville, Ky., chairman of sewer commission, proposes to build a sewage disposal plant estimated to cost \$30,000.

### Florida

TALLAHASSEE, FLA.—Houser Welding Co. plans to reconstruct its plant, destroyed recently by fire.

### Georgia

ALMA, GA.—Satilla Rural Electric Membership Corp. has received an additional \$240,000 allotment from REA, and will extend its rural electric transmission system through eight counties.

ATLANTA, GA.—Western Electric Co., New York, soon will let contracts for a three-story, 112 x 212-foot steel and brick warehouse. W. R. Katelle, New York, consulting engineer.

ATLANTA, GA.—Chevrolet Motor Co., Detroit, has awarded a contract to Barge Thompson Co., 136 Ellis street northeast, Atlanta, for a 121 x 722-foot assembly plant. Albert Kahn Inc., Detroit, architect.

BLUE RIDGE, GA.—H. A. Vestal Co. has awarded contract to Gillmore-Carmichael-Olson Co., Cleveland, for a factory estimated to cost approximately \$500,000.

### Mississippi

PASCAGOULA, MISS.—City will receive bids July 1 for new equipment for its water system. Involved are pumps, motors, controls, three pump houses, chlorinator, ammoniator, etc. L. C. Winterton, Pascagoula, is consultant.

### North Carolina

CHARLOTTE, N. C.—Brown Equipment & Mfg. Co. has given a contract to Southeastern Construction Co., Charlotte, for an assembly plant costing

\$100,000 with equipment.

### South Carolina

PAGELAND, S. C.—Lynchess River Electric Co-operative Inc. has been allocated \$220,000 by REA for constructing 230 miles of rural electric power transmitting lines in three counties.

SPARTANBURG, S. C.—City, W. W. Griffin, chairman of public works commission, plans to construct at cost of \$60,000 additional facilities at two sewage disposal plants.

### Tennessee

CLARKSVILLE, TENN.—Goodrich Tire & Rubber Co., Akron, O., receives bids July 12 for a 200 x 800-foot tire factory costing about \$1,000,000. Will be air-conditioned, contain power and refrigerating plants. (Noted May 15.)

### Louisiana

LAKE PROVIDENCE, LA.—Board of aldermen will receive bids June 26 for water well, motor generator set and static condensers.

### West Virginia

CHARLESTON, W. VA.—Union Carbide & Carbon Corp. has plans for an addition to its local plant estimated to cost as much as \$1,500,000. New facilities are for manufacturing vinylite, a synthetic resin used as a plastic and in making safety glass.

### Missouri

CALIFORNIA, MO.—Co-Mo Electric co-operative, Thomas D. Briscoe, president, is preparing specifications for a substation and distribution lines costing \$334,000. A. Y. Taylor & Co., Clayton, Mo., consultants.

HOLLISTER, MO.—White River Valley Electric co-operative, Frank Dawes, president, is drawing up plans for distributing lines and substation costing \$175,000. A. Y. Taylor & Co., Clayton, Mo., engineers.

KANSAS CITY, MO.—Chevrolet Motor Co., Detroit, has placed contracts for a one-story, 120 x 345-foot addition to its factory. Cost estimated more than \$40,000.

ROCK PORT, MO.—City, G. W. Chamberlain, mayor, has completed drawings for a \$45,000 extension to its diesel power plant. A. Y. Taylor & Co., Clayton, Mo., consultants.

### Oklahoma

CUSHING, OKLA.—Deep Rock Oil Corp., W. E. Moody, general superintendent, plans to expend \$75,000 for improvements and new equipment in its refinery.

### Minnesota

REDWOOD FALLS, MINN.—City, F. B. Forbes, recorder, is taking bids to 8 p.m., June 29, on furnishing and installing pumping, chlorinating and ammonia equipment in its waterworks. Certified check 5 per cent to accompany bid. City engineer, F. H. Anthony.

### Texas

LONGVIEW, TEX.—Rural Electric Co-operative Corp. asks bids on 150 miles electric power transmission lines in nine counties at cost of \$133,000. Freese & Nichols, Ft. Worth, Tex., consultants.

PT. ARTHUR, TEX.—Jefferson County Water Control and Improvement district No. 1. E. L. Stewart, president, receives bids July 8 for sewers and

waterworks costing \$251,385. J. B. Verse & Co., Pt. Arthur, engineers.

### Kansas

NORTON, KANS.—Decatur Electric co-operative, Fremont Schieffel, president, will soon get underway its plans for constructing about 105 additional miles of rural transmission lines serving 205 consumers. Ray H. Reed, Case building, Abilene, consulting engineer.

### Iowa

KNOXVILLE, IOWA.—Veterans' administration, L. H. Tripp, director of construction, Arlington building, Winton, has rejected preliminary and probably will soon take new on a boiler house addition here installation of a new boiler.

LA PORTE CITY, IOWA.—Board of trustees, F. E. Lehman, chairman, takes bids to 1:30 p.m., July 11, on a diesel engine of 450 to 500 horsepower, complete with generator, exciter, exhaust silencer, air filter, day tank and pipe. Young & Stanley, Muscatine, Iowa, consulting engineers.

MCGREGOR, IOWA.—Village, W. L. Stone Jr., clerk, is making a study in proposed project for a municipal power plant and distribution system.

### Colorado

DENVER.—Bureau of reclamation takes bids to July 10 for overhead traveling cranes and set of lifting beams to be installed at Grand Coulee power plant.

### Pacific Coast

LOS ANGELES.—Chrysler Motors Co. of California is ready to construct additions to its plant here at total cost \$117,000. New structures to be 160,000 sq. ft., 260 feet, and 160 x 280 feet.

LOS ANGELES.—Certificate of public utility business under name of Master Die & Stamping Co., 546 East Sixth street, has been issued to owner G. Buysier.

LOS ANGELES.—Certificate of public utility business under name of Master Saw Mfg. Co., 833 East Thirty-third street, has been issued to the owner Gladys L. Mooridian.

PASADENA, CALIF.—City of Pasadena takes bids to June 28 on construction and equipping a mechanical drafting tower for its light and power department. Estimated cost \$25,000. B. Delanty, Pasadena, consultant.

VERNON, CALIF.—American Can Co. Los Angeles, is building a one-story x 244-foot factory and warehouse estimated to cost \$125,000. J. F. Abbey, construction supervisor, care of owner.

SALEM, OREG.—Vista Heights water district has approved \$21,500 issue to finance installation of a water system including steel reservoirs, pumps and lines.

SEATTLE.—Coca-Cola Co., Atlanta, Ga., has awarded contract to Teufel Carlson, Seattle, for a 107 x 272 bottling plant estimated to cost \$200,000.

### Canada

HANNA, ALTA.—Town will soon take bids on a water tank and tower distribution system to cost \$100,000. J. H. Stephens, Hanna, engineer.



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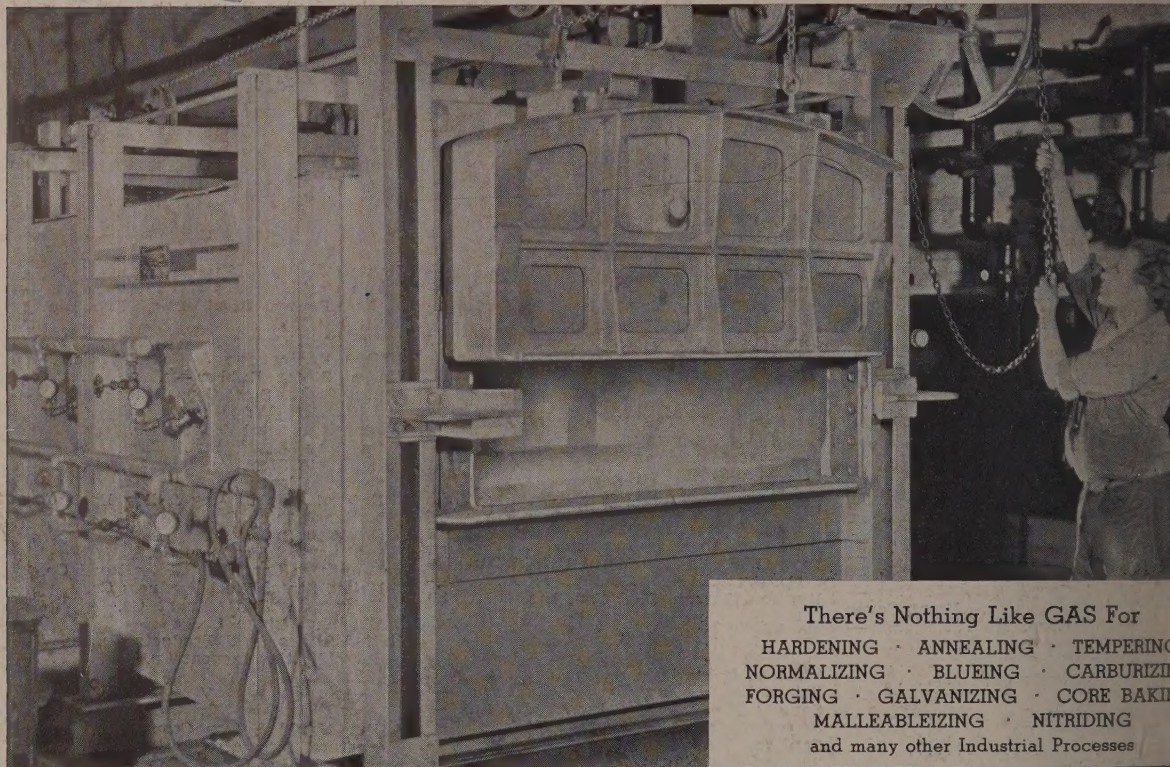
	Page		Page		Page
O., & Brother, Inc. ....	—	P		T	
The .....	—				
ge Co. ....	—				
<b>L</b>		Page Steel & Wire Division of Ameri-		Tar & Chemical Division of Koppers	
eel Co. ....	—	can Chain & Cable Co., Inc. ....	81	Co. ....	—
Malleable Co. ....	—	Parker-Kalon Corp. ....	82	Tennessee Coal, Iron & Railroad Co. ....	—
Sessions Co., The .....	—	Parkin, Wm. M., Co. ....	89	Thomas Machine Manufacturing Co. ....	—
chine Co., Inc. ....	—	Peabody Engineering Corp. ....	—	Thomas Steel Co., The .....	—
ol Co. ....	—	Penn Galvanizing Co. ....	—	Thomson-Gibb Electric Welding Co. ....	—
Electric Steel Co. ....	89	Pennsylvania Industrial Engineers. ....	87	Tide Water Associated Oil Co. ....	6, 7
L. K., Machine Tool Co., The .....	—	Pennsylvania Salt Mfg. Co. ....	—	Timken Roller Bearing Co. ....	—
orthrup Co. ....	—	Penola, Inc. ....	—	Timken Steel & Tube Division, The .....	—
Co., Inc. ....	—	Peoria Malleable Castings Co. ....	90	Timken Roller Bearing Co. ....	—
uctural Steel Co. ....	—	Perkins, B. F., & Son, Inc. ....	66	Tinnerman Stove & Range Co. ....	—
, & Sons Rope Co. ....	—	Pheoll Mfg. Co. ....	—	Titan Metal Mfg. Co. ....	90
ndry & Machine Division of .....	—	Philadelphia Gear Works ....	—	Toledo Stamping & Mfg. Co. ....	—
ox Co. ....	—	Pittsburgh Crushed Steel Co. ....	—	Tomkins-Johnson Co. ....	—
chine Co., The .....	—	Pittsburgh Lectromelt Furnace Corp. ....	—	Torrington Co., The .....	—
Electric Co. ....	—	Pittsburgh Plate Glass Co. ....	—	Towmotor, Inc. ....	—
Products Co., The .....	—	Pittsburgh Rolls Division of Blaw-	—	Tri-Lok Co. ....	—
, Lewis B. ....	—	Knox Co. ....	—	Trufo Fan Co. ....	77
Co. ....	—	Pittsburgh Steel Co. ....	—	Truscon Steel Co. ....	4, 5
Engineering Corp. ....	—	Plymouth Locomotive Works, Div.,	—		
Bros. Co. ....	—	The Fate-Root-Heath Co. ....	—	<b>U</b>	
<b>Mc</b>		Poole Foundry & Machine Co. ....	—	Union Carbide & Carbon Corp. ....	—
Hotel .....	—	Power Piping Corp. ....	—	Union Carbide Sales Co. ....	—
chine Co. ....	Back Cover	Pressed Steel Tank Co. ....	—	Union Drawn Steel Div., Republic	—
Metals Co. ....	—	Prest-O-Lite Co., Inc., The .....	—	Steel Corp. ....	4, 5
<b>M</b>		Progressive Mfg. Co. ....	87	Union Steel Castings Co. ....	—
-Hemphill Co. ....	—	Pure Oil Co., The .....	—	United Engineering & Foundry Co. ....	10
Death Machinery Co. ....	—	<b>R</b>		United States Rubber Co. ....	—
Drydock Co., The .....	—	Raymond Mfg. Co., Division of Asso-	—	United States Steel Corp., Subsidiaries	—
Conveyer Co. ....	—	ciated Spring Corp. ....	—	American Bridge Co. ....	—
nc. ....	—	Reliance Electric & Engineering Co. ....	—	American Steel & Wire Co. ....	—
The .....	—	Republic Steel Corp. ....	4, 5	Carnegie-Illinois Steel Corp. ....	—
Metal Corp. ....	—	Research Corp. ....	—	Columbia Steel Co. ....	—
chine Co. ....	Front Cover	Riverside Foundry & Galvanizing Co. ....	—	Cyclone Fence Co. ....	—
hermit Corp. ....	—	Roper, Geo. D., Corp. ....	76	Federal Shipbuilding & Dry Dock Co. ....	—
o., The .....	—	Ruemelin Mfg. Co. ....	—	National Tube Co. ....	—
olling Mill Corp. ....	—	Russell, Burdall & Ward Bolt & Nut	—	Oil Well Supply Co. ....	—
eel Products Co. ....	—	Co. ....	—	Scully Steel Products Co. ....	—
Steel Co. ....	—	Ryerson, Joseph T., & Son, Inc. ....	89	Tennessee Coal, Iron & Railroad Co. ....	—
nstruction Co. ....	—	<b>S</b>		United States Steel Products Co. ....	—
Engineering Co. ....	—	St. Joseph Lead Co. ....	78	Universal Atlas Cement Co. ....	—
lt Co. ....	—	Salem Engineering Co. ....	—	Virginia Bridge Co. ....	—
n Works ....	—	Samuel, Frank, & Co., Inc. ....	—	United States Steel Products Co. ....	—
amship Co. ....	—	San Francisco Galvanizing Works. ....	—	Universal Atlas Cement Co. ....	—
<b>N</b>		Sanitary Tinning Co., The .....	—	<b>V</b>	
Alloy Steel Co. ....	—	Sawyer Electrical Mfg. Co. ....	—	Valley Mould & Iron Corp. ....	—
earing Metals Corp. ....	—	Seavill Mfg. Co. ....	—	Vanadium Corp. of America ....	43
ylinder Gas Co. ....	—	Scully Steel Products Co. ....	—	Virginia Bridge Co. ....	—
rie Corp. ....	—	Searles Electric Welding Works. ....	84	Vulcan Steam Forging Co. ....	90
orge & Ordnance Co. ....	—	Shafer Bearing Corporation ....	—	<b>W</b>	
ead Co. ....	—	Shaw-Box Crane & Hoist Division,	—	Wagner Electric Corp. ....	—
umber & Creosoting Co. ....	—	Manning, Maxwell & Moore, Inc. ....	—	Waldron, John, Corp. ....	—
oil & Foundry Co. ....	—	Shell Union Oil Corporation ....	—	Washburn Wire Co. ....	24
crew & Mfg. Co. ....	—	Shenango Furnace Co., The .....	—	Wean Engineering Co., Inc. ....	Back Cover
Steel Corp. ....	8, 85	Shenango-Penn Mold Co. ....	—	Weirton Steel Co. ....	—
tone Co. ....	89	Shepard Niles Crane & Hoist Corp. ....	—	Welding Equipment & Supply Co. ....	—
Telephone Supply Co., Inc. ....	—	Shuster, F. B., Co., The .....	—	Wellman-Smith Owens Eng. Corp. Ltd.	—
ube Co. ....	—	Simonds Gear & Mfg. Co. ....	—	Back Cover	—
ture, Division General Mo-	—	Simonds Saw & Steel Co. ....	—	Western Precipitation Corp. ....	—
nd Coal & Coke Co. ....	—	Sipe, James B., & Co. ....	—	Westinghouse Electric & Mfg. Co. ....	—
y Zinc Co. ....	31	SKF Industries, Inc. ....	—	West Penn Machinery Co. ....	91
& New Jersey Lubricant Co. ....	—	Sleeper & Hartley, Inc. ....	—	West Steel Casting Co. ....	90
achine & Tool Works. ....	—	Snyder, W. P., & Co. ....	—	Whitcomb Locomotive Co., The, Div.,	—
l Products Div., Republic	—	Socony-Vacuum Oil Co., Inc. ....	—	The Baldwin Locomotive Works. ....	—
mp. ....	4, 5	Spowers, W. H., Jr. ....	—	Whitehead Stamping Co. ....	—
mann Bearings Corp. ....	—	Standard Galvanizing Co. ....	—	White Tar Co. of New Jersey, Inc. ....	—
, The .....	—	Standard Pressed Steel Co. ....	—	Wickwire Brothers ....	—
<b>O</b>		Standard Steel Works Co. ....	—	Wickwire Spencer Steel Co. ....	47
ric Mfg. Co. ....	89	Standard Tube Co. ....	89	Wilcox, Crittenden & Co., Inc. ....	—
-Alloys Corp. ....	—	Stanley Works ....	—	Wilson, Lee, Engineering Co. ....	Back Cover
otive Crane Co. ....	89	Steel & Tubes, Inc. ....	4, 5	Wilson Welder & Metals Co., Inc. ....	—
Foundry Co., The .....	—	Steel Founders' Society of America. ....	—	Wisconsin Steel Co. ....	—
Supply Co. ....	—	Stewart Furnace Division, Chicago	—	Witt Cornice Co., The .....	—
ethylene Co. ....	—	Flexible Shaft Co. ....	87	Wood Preserving Corp., The .....	—
		Stop-Rust Co., The .....	—	Worthington Pump & Machinery Corp. ....	—
		Streine Tool & Mfg. Co., The .....	—	Worth Steel Co. ....	—
		Strong Steel Foundry Co. ....	—	Wyckoff Drawn Steel Co. ....	—
		Sturtevant, B. F., Co. ....	55		
		Sun Oil Co. ....	—	<b>Y</b>	
		Superior Steel Corp. ....	—	Yale & Towne Mfg. Co. ....	—
		Surface Combustion Corp. ....	—	Youngstown Alloy Casting Corp. ....	—
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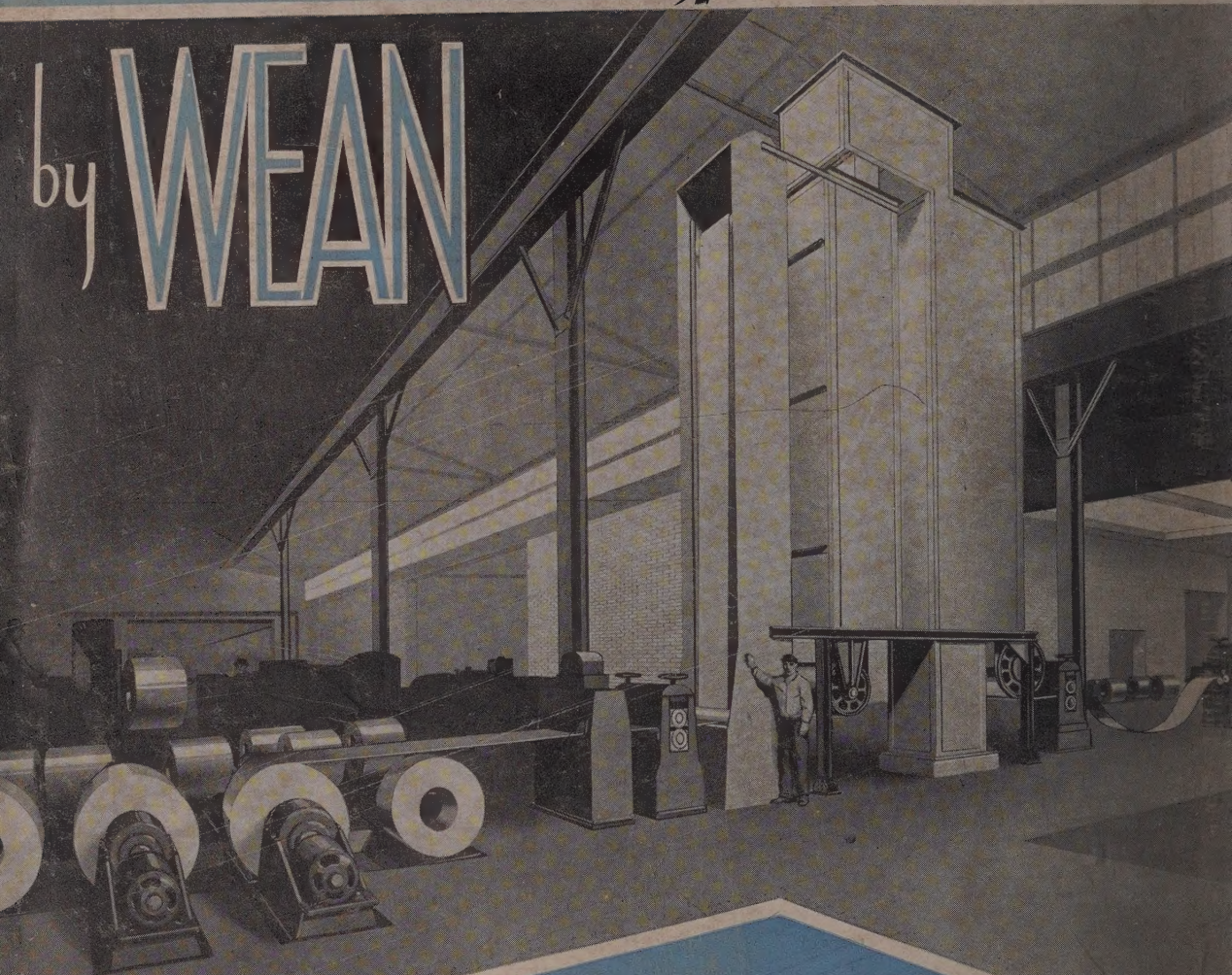
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